SELECTED WATER RESOURCES ABSTRACTS

VOLUME 8, NUMBER 1
JANUARY 1, 1975

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SELECTED
WATER RESOURCES ABSTRACTS

A Semimonthly Publication of the Water Resources Scientific Information Center,
Office of Water Research and Technology, U.S. Department of the Interior

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The Secretary of the U. S. Department of the Interior has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through August 31, 1978.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

FOREWORD

Selected Water Resources Abstracts, a semimonthly journal, includes abstracts of current and earlier pertinent monographs, journal articles, reports, and other publication formats. The contents of these documents cover the water-related aspects of the life, physical, and social sciences as well as related engineering and legal aspects of the characteristics, conservation, control, use, or management of water. Each abstract includes a full bibliographical citation and a set of descriptors or identifiers which are listed in the **Water Resources Thesaurus.** Each abstract entry is classified into ten fields and sixty groups similar to the water resources research categories established by the Committee on Water Resources Research of the Federal Council for Science and Technology.

WRSIC IS NOT PRESENTLY IN A POSITION TO PROVIDE COPIES OF DOCUMENTS ABSTRACTED IN THIS JOURNAL. Sufficient bibliographic information is given to enable readers to order the desired documents from local libraries or other sources.

Selected Water Resources Abstracts is designed to serve the scientific and technical information needs of scientists, engineers, and managers as one of several planned services of the Water Resources Scientific Information Center (WRSIC). The Center was established by the Secretary of the Interior and has been designated by the Federal Council for Science and Technology to serve the water resources community by improving the communication of water-related research results. The Center is pursuing this objective by coordinating and supplementing the existing scientific and technical information activities associated with active research and investigation program in water resources.

To provide WRSIC with input, selected organizations with active water resources research programs are supported as "centers of competence" responsible for selecting, abstracting, and indexing from the current and earlier pertinent literature in specified subject areas.

Additional "centers of competence" have been established in cooperation with the Environmental Protection Agency. A directory of the Centers appears on inside back cover.

Supplementary documentation is being secured from established discipline-oriented abstracting and indexing services. Currently an arrangement is in effect whereby the BioScience Information Service of Biological Abstracts supplies WRSIC with relevant references from the several subject areas of interest to our users. In addition to Biological Abstracts, references are acquired from Bioresearch Index which are without abstracts and therefore also appear abstractless in SWRA. Similar arrangements with other producers of abstracts are contemplated as planned augmentation of the information base.

The input from these Centers, and from the 51 Water Resources Research Institutes administered under the Water Resources Research Act of 1964, as well as input from the grantees and contractors of the Office of Water Research and Technology and other Federal water resource agencies with which the

Center has agreements becomes the information base from which this journal is, and other information services will be, derived; these services include bibliographies, specialized indexes, literature searches, and state-of-the-art reviews.

Comments and suggestions concerning the contents and arrangements of this bulletin are welcome.

Water Resources Scientific Information Center
Office of Water Research and Technology
U.S. Department of the Interior
Washington, D. C. 20240

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Research Inst. for Water Resources Development, Budapest, (Hungary).
For primary bibliographic entry see Field 2H.
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ANALYSIS OF THE TIME SERIES ON VARIATIONS IN NATURAL STORAGE IN LAKE BALATON,
Technical University of Budapest, (Hungary).
For primary bibliographic entry see Field 2H.
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For primary bibliographic entry see Field 2H.
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LONG-TERM WATER STAGE REGIME IN NATURAL LAKES OF KARELIA AND ITS CHANGES IN VIEW OF CONVERSION OF LAKES INTO STORAGE RESERVOIRS,
Akademiya Nauk SSSR, Petrozavodsk. Karelskii Filial.
For primary bibliographic entry see Field 2H.
W75-00094

CHARACTERISTICS OF THE REGIME AND STRUCTURE OF WATER MASSES IN THE VOLGA RESERVOIRS,
Akademiya Nauk SSSR, Moscow. Institut Vnutrennykh Vod.
For primary bibliographic entry see Field 2H.
W75-00095

INFLUENCE OF STORAGE RESERVOIRS ON THE THERMAL REGIME OF RIVERS,
Panstwowy Instytut Hydrologiczno-Meteorologiczny, Gdynia (Poland).
For primary bibliographic entry see Field 4A.
W75-00097

SURFACE WATER POLLUTION BY THE DISCHARGE OF COMBINED SEWER SYSTEMS (POLLUTION DES EAUX DE SURFACE PAR LE DECHARGE DES RESEAUX D'EGOUT UNITAIRES),
J. Bex.
Techniques et Sciences Municipales, Vol 69, No 4, p 185-189, April, 1974. 2 fig, 1 tab, 12 ref.

Descriptors: *Sewer systems, *Storm runoff, *Combined sewers, Municipal wastes, Storm water, Effluents, Path of pollutants, Rainfall-runoff relationships.
Identifiers: *Receiving waters, Storm overflows, Pollutant load, Retention basins.

Problems of the pollution of receiving waters by the discharge of storm runoff in combined sewer systems, and methods for the design of storm overflows in such sewer systems are discussed. In combined systems, all or part of the storm runoff, far exceeding the quantity of dry-weather runoff, is directly discharged into the receiving waters without treatment. This is likely to cause pollution surge in the latter due to its inherent pollution, and to the entrainment of municipal effluent and sewer sediments. The dilution method, previously used for the calculation of storm overflows, is unacceptable since the overflow is polluted, and it is not possible to evaluate the pollutant load caused in the receiving waters. Instead, storm overflows should be calculated on the basis of a judiciously chosen critical rain, usually varying from 15 to 25 liter/sec. The pollutant load of the receiving waters due to storm water runoff can be abated by the use of retention basins, or by partial purification of the storm runoff. (Takacs-FIRL)
W75-00141

INCREASING THE EFFICIENCY OF THE USE OF GUIDE CORDS IN THE MAINTENANCE OF A GIVEN SLOPE (POVYSHENIYE EFFEKTIVNOSTI ISPOL'ZOVANIYA KOPIRA-NITI PRI PODDERZHIVANII ZADANNOGO UKLONA),
D. K. Beylin, and U. F. Strautin.
Gidrotekhnika i Melioratsiya, Vol 3, No 4, p 65-68, April, 1974. 3 fig.

Descriptors: *Mathematical studies, *Equations, *Slope protection, Operation, Soil mechanics, Design.
Identifiers: *USSR, Guide cord, Digging.

A method for the elimination of errors occurring during digging operation due to the sag of the guide cord is described. The guide cord is acted upon by a force that is equal to the force causing the sag but opposite in direction in the point of its contact with the depth feeler. The lifting mechanism can be in the form of a two-arm lever with an adjustable balance weight at one end and with a hook at the other. The use of the lifting mechanism permits the inter-support distance to be increased from 10 m to 60-100 m. (Takacs-FIRL)
W75-00142

THE 1971 DROUGHT IN SOUTH FLORIDA AND ITS EFFECT ON THE HYDROLOGIC SYSTEM,
Geological Survey, Tallahassee, Fla.
M. A. Benson, and R. A. Gardner.
Available from NTIS, Springfield, Va 22161 as PB-235 269/As $3.75 printed copy; $2.25 microfiche. Water-Resources Investigations 12-74, July 1974. 46 p, 16 fig, 3 tab, 11 ref.

Descriptors: *Droughts, *Florida, Hydrologic budget, Water levels, Water balance, Precipitation(Atmospheric), Runoff, Frequency analysis, Groundwater, Water management(Applied).

The 1971 dry season rainfall in south Florida was low enough that the public media and concerned public officials unanimously characterized the event as a severe drought. Rainfall over all of south Florida during the 1970 wet season and the 1970-71 dry season was less than 85% of normal, as was the 1971 wet season rainfall on the heavily populated southeast coast of Florida. Rainfall during the dry season ranged from 20% to 63% of normal and recurrence intervals for dry season rainfall of this magnitude ranged from 100 years to several hundred years. Canal flow and groundwater levels reflected the drought conditions but in most cases did not set record lows. No permanent undesirable effects occurred as a result of the drought.
W75-00220

HYDROLOGY OF THE DISMAL SWAMP, VIRGINIA-NORTH CAROLINA,
Geological Survey, Richmond, Va.
For primary bibliographic entry see Field 2F.
W75-00238

OWEGO ENVIRONMENTAL STUDY,
Cornell Univ., Ithaca, N.Y. Coll. of Architecture, Art and Planning.
For primary bibliographic entry see Field 6G.
W75-00272

SPILLWAY DESIGN FOR SERIES OF RESERVOIRS,
Pacific Gas and Electric Co., San Francisco, Calif.
For primary bibliographic entry see Field 8B.
W75-00315

STUDIES ON SUBTERRANEAN WATERS: 19. THE KARST SYSTEM OF BAGET: I. FIRST ESTIMATIONS ON THE DRIFT OF AQUATIC INVERTEBRATES OF EPIGENE ORIGIN, (IN FRENCH),
Paul Sabatier Univ., Toulouse (France). Laboratoire d'Hydrobiologie.
H. Decamps, and R. Rouch.
Ann Speleol. Vol 28, No 1, p 89-110. 1973. Illus. (English summary).

Descriptors: *Aquatic insects, Larvae, *Karst, *Aquatic drift, Invertebrates, *Chironomidae.

Some filtrations carried out at the principal outlet of the Karstic system of Baget showed that numerous larvae of aquatic insects (Baetidae, Plecoptera, Trichoptera and Chironomidae) of epigeous origin were carried down into the depths (of the caves) during floods. The variations in this drift were studied for several floods in the hydrological cycles of 1970-71 and 1971-72. The total number of epigeous invertebrates in the drift was estimated from hourly samples taken at the principal outlet. The phenomena presented here are interpreted as a function of the hydrogeological mechanisms of the Baget system.--Copyright 1974, Biological Abstracts, Inc.
W75-00358

2B. Precipitation

RUNOFF CONDITIONS, CALCULATION METHODS, DIMENSIONING CRITERIA (ABFLUSSVERHAELTNISSE, BERECHNUNGSMETHODEN, DIMENSIONIERUNGSGRUNDSAETZE),
For primary bibliographic entry see Field 2E.
W75-00140

THE 1971 DROUGHT IN SOUTH FLORIDA AND ITS EFFECT ON THE HYDROLOGIC SYSTEM,
Geological Survey, Tallahassee, Fla.
For primary bibliographic entry see Field 2A.
W75-00220

HYDROLOGIC DATA OF THE JUNE 1972 FLOOD IN PENNSYLVANIA,
Geological Survey, Harrisburg, Pa.
For primary bibliographic entry see Field 2E.
W75-00235

SOUTHWESTERN UNITED STATES SUMMER MONSOON SOURCE--GULF OF MEXICO OR PACIFIC OCEAN,
National Weather Service Forecast Office, Phoenix, Ariz.
J. E. Hales, Jr.
Journal of Applied Meteorology, Vol 13, p 331-342, April 1974. 14 fig, 9 ref.

Descriptors: *Air circulation, *Seasonal, *Monsoons, Arizona, Gulf of Mexico, Pacific Ocean, Precipitation, Thunderstorms, Sea breezes, Summer, Pressure, Subtropic, Moisture.
Identifiers: *Tropical moisture flux, *Pressure gradient, Summer monsoon, Gulf of California.

Moist air from the tropics moves into northwest Mexico and the southwestern portion of the United States during the early part of the summer season. This is analogous to the monsoon circulation in other sections of the globe. The annual change in circulation has been related to the northward and westward development of the large subtropical high pressure system over the southern United States. With this change the moist tropical air over the Gulf of Mexico is believed to be carried across Mexico and into the southwestern United States. The mountains of Mexico provide a formidable barrier for the movement of the Gulf of Mexico moisture westward. It has been shown that half of the precipitable water vapor in the atmosphere over the Arizona deserts in the summer months is below the 800-mb level. This is inconsistent with the idea of the Gulf of Mexico supplying the greatest proportion of the moisture. Support is presented for the greatest percentage of tropical moisture in the southwest United States and northwest Mexico coming from the Pacific Ocean by way of the Gulf of California rather than from the Gulf of Mexico. (Jones-ISWS)
W75-00332

NORTH ATLANTIC TROPICAL CYCLONES, 1972,
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
Richard M. DeAngelis.
Mariners Weather Log, Vol 17, No 1, p 6-14, January 1973. 6 fig.

Descriptors: *Tropical cyclones, *Storm structure, *Hurricanes, Storm water, Damages, Atlantic Ocean.
Identifiers: North Atlantic Ocean, *Tropical storms, Hurricane Agnes 1972, Hurricane Betty 1972, Tropical Storm Carrie 1972, Hurricane Dawn 1972.

There were just four tropical cyclones in 1972/in the North Atlantic--the lowest total in the past 30 yr. Three of those storms reached hurricane intensity. Agnes, of little concern to mariners, became the most destructive storm in U.S. history. There were 121 deaths in the United States this season-117 people died in Agnes and four people died during Carrie. Seven people died in Cuba during Agnes. Total storm damage in the United States was due to Agnes and Carrie. Agnes caused an estimated $3.097 billion; Carrie caused $1.78 million. Summaries of individual tropical cyclones which reached tropical storm strength including tracks are given. Summaries of extratropical portions of these tropical cyclones if severe can be found in the appropriate Smooth or Rough Log. (NOAA)
W75-00374

FIFTY-FIFTH ANNUAL MEETING OF THE AMERICAN GEOPHYSICAL UNION APRIL 8-12, 1974. PROCEEDINGS IFYGL SYMPOSIUM.
National Oceanic and Atmospheric Administration, Rockville, Md.
For primary bibliographic entry see Field 2H.
W75-00392

RAINFALL MEASUREMENTS DURING HURRICANE AGNES BY THREE OVERLAPPING RADARS,
Center for the Environment and Man, Inc., Hartford, Conn.; and Atmospheric Environment Service, Toronto (Ontario).
For primary bibliographic entry see Field 2H.
W75-00396

THE IFYGL LAKE METEOROLOGY PROGRAM,
National Oceanic and Atmospheric Administration, Washington, D.C.; and Atmospheric Environment Service, Toronto (Ontario).
For primary bibliographic entry see Field 2H.
W75-00397

METEOROLOGICAL STUDIES IN RELATION TO CLOUD SEEDING EXPERIMENTS OVER SOUTH FLORIDA IN 1971,
Rosenstiel School of Marine and Atmospheric Science, Miami, Fla.
For primary bibliographic entry see Field 3B.
W75-00482

SEVERE LOCAL STORMS RESEARCH AT PURDUE UNIVERSITY,
Purdue Univ., Lafayette, Ind. Dept. of Geosciences.
E. M. Agee, and T. A. Schroeder.
Final Report, 1973. March 1974. 16 p, 2 fig, 10 ref.

Descriptors: *Tornadoes, *Thunderstorms, *Squalls, Storms, Indiana.
Identifiers: Synoptic weather patterns, Severe storms.

As a part of the study of severe local storms, this report presents an outline of the problem area selected and the progress made in enhancing the knowledge and understanding in this area of severe storm dynamics. On 14 May 1972 a strong tornado occurred on the east side of Indianapolis, Indiana. There was a remarkable evolution of a squall line wave pattern and associated severe thunderstorm activity. Close analysis of the synoptic weather pattern responsible for this severe storm outbreak and calculations of severe storm indices revealed no quantitative explanation for the degree of severity achieved. (NOAA)
W75-00487

PREDICTING THE CONDITIONAL PROBABILITY OF FROZEN PRECIPITATION,
National Weather Service, Silver Spring, Md.
H. R. Glahn, and J. R. Bocchieri.
NOAA Technical Memorandum NWS TDL-51, March 1974. 33 p, 11 fig, 11 tabs, 12 refs, 2 append.

Descriptors: *Precipitation(Atmospheric), *Weather forecasting, *Forecasting, United States.
Identifiers: *Objective forecasting, *Forecast verification, Verification, Prediction equations, Frozen precipitation, Conditional probability.

A system is developed which produces objective forecasts of conditional probability of frozen precipitation for the conterminous United States. Development of the system consists of two basic steps, in each of which the MOS (Model Output Statistics) concept is used. First, for each of 186 stations, we find a '50%' value for each of three variables predicted by the National Meteorological Center's Primitive Equation (PE) model: 1000-500 mb thickness, boundary-layer potential temperature, and 850-mb temperature. Secondly, the deviations from the 50% values are determined for each station for each variable; the relative frequency (for those cases when precipitation occurred) of frozen precipitation is then computed, again with the logit model, as a function of these new variables. In order to get stable results in this last step, data for all stations are combined. In addition to the meteorological variables, we also use the first harmonic of the day of year and station elevation as predictors. Separate logit equations are determined for each of the PE run times, 0000 and 1200 GMT, and for each of four projections, 12, 24, 36, and 48 hours. This system was put into operation by the National Weather Service in November 1972. Both teletypewriter and facsimile products are being distributed to field offices twice daily. A comparative verification on independent data for the 12- and 36-hr forecast projects shows the objective system produced better forecasts than those prepared subjectively at the National Meteorological Center. (NOAA)
W75-00490

SPLASH (SPECIAL PROGRAM TO LIST AMPLITUDES OF SURGES FROM HURRICANES). PART TWO. GENERAL TRACK AND VARIANT STORM CONDITIONS,
National Weather Service, Silver Spring, Md. Techniques Development Lab.
C. P. Jelesnianski.
NOAA Technical Memorandum NWS TDL-52, March 1974. 55 p, 19 fig, 1 tab, 11 ref, 3 append.

Descriptors: *Storm surges, *Hurricanes, *Resonance, Coasts, Forecasting, *Computer programs, Surges, Tropical cyclones.
Identifiers: *Storm tracks, *Recurving storms, Surge envelopes, Coastal surge.

Part one, an operational computer program, has been expanded in part two to accommodate storms with generalized motions of not too great complexity. Examples are storms that move alongshore, recurve, remain stationary, accelerate, and landfall (exit). Also, storm strength and size are allowed to vary in a continuous monotonic manner with time. Surges generated by these generalized storms are complicated in space and time, and they can occur on an extensive coastline (hundreds of miles). Five track positions (spaced at 6-hr increments on the storm path) and simple meteorological parameters are the meteorological input for the program. Detailed meteorological phenomena such as explosive deepening of storms, violent changes in storm track, and sudden accelerations of the storm are not considered. In part two, we discuss--in a qualitative and heuristic manner--several strange dynamic phenomena generated by the storms with generalized motions. Several special examples are computed by the program and then interpreted for forecasting. (NOAA)
W75-00491

VARIABILITY OF HIGH PLAINS PRECIPITATION,
National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.
C. D. Whiteman.
Available from Superintendent of Documents, Washington, D.C. 20402 as C55.13:ERL 287-APCL 31. NOAA Technical Report ERL 287-APCL 31, March 1973. 46 p, 22 fig, 8 tab, 5 ref.

Descriptors: *Precipitation(Atmospheric), *Climates, *Weather data, Spatial distribution, Montana, North Dakota, South Dakota, Wyoming, Nebraska, Colorado, Kansas, New Mexico, Oklahoma, Texas, Statistical analysis, *Great Plains.
Identifiers: *Precipitation data(Atmospheric), *Annual precipitation data, *Monthly precipitation data, Crop-growing season, Cold season, High Plains(US).

Precipitation statistics are presented for the High Plains area of the United States. These include measures of the variability of annual, monthly, cold season, and crop-growing season precipitation. Maps show the spatial distribution of coefficients of variation. The natural variability of High Plains precipitation is compared with that of other parts of the country having similar annual amounts of precipitation. Precipitation in the High Plains has less natural variability than in the Southwest. High Plains precipitation, however, does vary more than that in the semi-arid regions of eastern Washington, eastern Oregon, Idaho, and Utah. Annual coefficients of variation in the High Plains range from 0.17 to 0.43; the lowest are in the northern and eastern High Plains. Cold season coefficients range from 0.21 to 0.66 and the lowest coefficients are in the eastern and northwestern plains, the crop-growing season coefficients range from 0.20 to 0.51 with the lowest coefficients occurring in the eastern and northern plains. Monthly precipitation may vary considerably from year to year with the majority of monthly precipitation amounts usually falling below the monthly mean as computed over a period of 30 or 40 years. (NOAA)
W75-00502

RADAR RAINFALL PATTERN OPTIMIZING TECHNIQUE,
National Severe Storms Lab., Norman, Okla.
E. A. Brandes.
NOAA Technical Memorandum ERL NSSL-67, March 1974. 16 p, 12 fig, 5 tab, 18 ref.

Descriptors: *Precipitation(Atmospheric), *Radar, *Rainfall, *Meteorological data, Optimization, Storms, Rain gages, *Data processing, Calibrations, Watersheds(Basins), Weather data.

Estimates of precipitation are improved when quantitative radar data are combined with rain gage observations. Gage observations are used to calibrate radar data as well as to estimate precipitation in areas without radar data. Error estimates of areal precipitation depth for five cases of widespread rainfalls over a 1000 n sq mile watershed, averaged 8 and 15 percent with densities of one gage per 270 and 675 n sq miles, respectively. Precipitation estimates derived from an objective analysis of rainfall depths observed at the calibrating gages alone produced errors of 10 and 21 percent. Radar data added to gage observations increased the explained variance at test gages, beyond that given by gage data alone, from 66 to 72 percent and 50 to 59 percent for the same calibrating gages. Large storm-to-storm variations in average radar calibration and large spatial correction variations within storms were attributed to propagation effects. (NOAA)
W75-00505

A STUDY OF TORNADO PROXIMITY DATA AND ON OBSERVATIONALLY DERIVED MODEL OF TORNADO GENESIS,
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
R. A. Maddox.
Paper No 212, November 1973. 109 p, 50 fig, 6 tab, 66 ref, 2 append.

Descriptors: *Tornadoes, *Storms, *Thunderstorms, *Moisture, *Climatology, Winds, Temperature, Model studies.
Identifiers: *Storm structure, Synoptic conditions, Vortex initiation, Severe storms, Tornado genesis.

The results of a detailed analysis of 159 tornadoe proximity rawinsonde soundings are considered in Part I of this study. Soundings were stratified into four different categories, based on mean wind characteristics. The tornado soundings were compared to soundings associated with destructive multiple tornado outbreaks, and to soundings associated with non-tornado producing severe thunderstorms. It is found that there is no distinct set of 'tornado conditions'. Tornadoes are associated with a surprisingly large range of synoptic conditions. Sub-synoptic scale phenomena play an important role in tornado production. There are no distinctive differences between general tornado, multiple tornado outbreak, and severe thunderstorm soundings. Situations which may produce severe thunderstorms also have some discrete probability of producing tornadoes. A suggested new manner of issuing severe thunderstorm and tornado watches is presented. An extensive discussion of tornado features and a hypothesized physical model of tornado genesis is presented in Part II of this paper. (NOAA)
W75-00510

NUMERICAL GRAVITY WAVE AND LINEAR ADVECTION EXPERIMENTS ON A ONE-DIMENSIONAL NESTED GRID,
National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.
M. S. Moss.
NOAA Technical Memorandum ERL WMPO-11, January 1974. 30 p, 12 fig, 4 tab, 9 ref. Also as NHRL-107.

Descriptors: *Numerical analysis, *Gravity waves, *Hurricanes, Pressure, Reflected waves, Advection, Model studies.
Identifiers: *Grid-mesh ratio, *Linear advection, Monochromatic waves, Nested grids.

Numerical experiments with a mesh refinement technique are applied to the finite difference equations that represent one-dimensional gravity wave and advection phenomena. The grid consists of a coarse mesh and a fine mesh interfaced at the origin. The problem of a nearly monochromatic sine wave approaching the interface from the fine-mesh side is examined. Numerical experiments that parallel the analytic study of Morse (An Analytic Study of Mesh Refinement Applied to the Wave Equation (Part 1), NOAA Technical Memorandum ERL-WMPO5, 1973), confirm most of his conclusions. In addition, there is a relatively short wave cutoff, below which practically all the energy is trapped on the fine mesh. Integrating a linear advection equation on the nested grid results in a 2 delta x separation of the solution on the fine mesh after the wave reaches the interface. The problem is corrected by using upstream differences for evaluating the tendency at the interface. (NOAA)
W75-00514

2C. Snow, Ice, and Frost

THE PHYSICS OF ICE,
Cold Regions Research and Envineering Lab., Hanover, N.H.
J. W. Glen.
Science and Engineering Monograph II-C2a, April 1974. 79 p, 33 fig, 4 tab, 282 ref, append.

Descriptors: *Ice, *Cryology, *Physics, Optical properties, Crystallography, Melting, Freezing, Thermodynamics, Crystallization, Electrical properties, Crystal growth.
Identifiers: *Ice physics.

This monograph summarizes existing knowledge of the physics of ice. It covers the crystalline structure of ice including defects in structure, polycrystalline ice and grain boundaries, electrical properties of ice, thermal properties of ice, propagation of electromagnetic waves in ice and optical properties of ice, nucleation and growth of ice crystals, melting and evaporation of ice, and surface properties of ice. It also includes a comprehensive bibliography. (Knapp-USGS)
W75-00228

THE ANTARCTIC TREATY: A STEPPING STONE TO THE DEVELOPMENT OF AN INTERNATIONAL SEABED REGIME,
For primary bibliographic entry see Field 6E.
W75-00281

EVAPORATION-CONDENSATION AND SNOW-MELT MEASUREMENTS IN FINLAND,
Finish Hydrological Office, Helsinki.
For primary bibliographic entry see Field 2D.
W75-00323

THE INFLUENCE OF CLOUDINESS ON THE NET RADIATION BALANCE OF A SNOW SURFACE WITH HIGH ALBEDO,
Innsbruck Univ. (Austria). Physikalisches Institut.
W. Ambach.
Journal of Glaciology, Vol 13, No 67, p 73-84, 1974. 12 fig, 7 ref.

Descriptors: Radiation, *Albedo, *Cloud cover, *Snow, *Ice, Climatology, Meteorology, Polar regions, Infrared radiation, Ultraviolet radiation, Heat transfer.
Identifiers: *Radiation balance, *Greenland, Greenhouse effect.

Short-wave and long-wave radiation fluxes were measured during summer in the accumulation area of the Greenland ice sheet. The diurnal variations of the radiant fluxes over polar snow and ice surfaces, with an albedo greater than 70%, were presented for clear (0/10 cloudiness) and overcast skies (10/10 cloudiness). The mean daily radiation balance under clear skies was 75 J/sq cm-day, while under overcast skies the mean daily radiation balance was 270 J/sq cm-day. Hence, at a high albedo, a decrease (because of greater cloudiness) in the short-wave radiation balance, even in midsummer, is more than compensated for by an increase in the long-wave radiation balance over polar ice and snow surfaces. High values of net radiation balance were therefore correlated with high values of long-wave radiation balance and low values of short-wave radiation balance. (Vogel-ISWS)
W75-00324

MECHANICAL DRILL FOR DEEP CORING IN TEMPERATE ICE,
Iceland Univ., Reykjavik. Science Inst.
For primary bibliographic entry see Field 8C.
W75-00325

HEAT EXCHANGE OVER A MELTING SNOW SURFACE,
Centre National de la Recherche Scientifique, Grenoble (France). Laboratoire de Glaciologie.
A. C. de La Casiniere.
Journal of Glaciology, Vol 13, No 67, p 55-72, 1974. 15 fig, 3 tab, 7 ref.

Descriptors: *Energy budget, *Heat transfer, *Heat balance, *Radiation, *Water vapor, Momentum transfer, Tubulence, Wind velocity, On-site investigations, Snow, Air temperature, Ablation, Melting.
Identifiers: *Thermal balance, Wind velocity profiles, Radiative flux, French Alps, Spain, Heat exchange layer.

The relative importance of the principal elements of the thermal balance above snow during a period of melting was evaluated using recent studies of the turbulent transfer in the boundary layer. Several anomalies in the profiles prove the continuing presence, near to the surface, of a thick layer of air apparently reheated by the radiative flux. It was shown that the upper surface of this exchange layer ought to be considered as the new level for the origin of profiles, and taken as the exchange surface. The importance of noctural refreezing was quantified. Excellent correlations were found between mean air temperature and total energy balance; they allowed the establishment of an approximate, non-linear expression for the effective daily ablation of snow as a function of mean air temperature. This relation gives satisfactory results at high and intermediate altitudes, in horizontal uncovered terrain. The measurements were made in the French Alps at 3550 m and in Spain at the latitude of Madrid at 1860 m. (Jones-ISWS)
W75-00327

THE CAPILLARY EFFECTS ON WATER PERCOLATION IN HOMOGENEOUS SNOW,
Cold Regions Research and Engineering Lab., Hanover, N.H.
S. C. Colbeck.
Journal of Glaciology, Vol 13, No 67, p 85-97, 1974. 6 fig, 9 ref.

Descriptors: *Snow, *Percolating water, Capillary action, Permeability, Hysteresis, Firn, Homogeneity, Lysimeters, Darcys Law, Ice, Laboratory tests, Diffusion, Percolation, Water flow, Pores.
Identifiers: *Snow lysimeters, Darcian flow concepts, Firn-ice transition, Gravity-flow theory, Capillary-pressure curve.

A theoretical basis for introducing capillary effects into the theory of water percolation through snow was given. A capillary pressure-liquid saturation relationship found in the laboratory was used together with the theory to make a quantitative examination of capillary effects. Capillarity accounts for less than 10% of the total force when water flux is 10 to the minus 8th power (m/s) although the percentage rapidly increases for smaller fluxes. The experiments suggested that the irreducible water content of dense snow was 7% of the pore volume. It was concluded that the wavefront diffusion seen in lysimeter studies is not the result of capillary action. Other possible causes were suggested. (Schicht-ISWS)
W75-00335

THE 1971-72 GREAT LAKES ICE SEASON,
National Weather Service, Detroit, Mich.
G. D. Linklater.
Mariners Weather Log, Vol 17, No 1, p 15-16, January 1973. 5 fig.

Descriptors: *Navigation, *Ice cover, *Ice jams, Great Lakes, Storms, Meteorology, St. Lawrence Seaway, Lake Ontario, Lake Erie, Lake Superior, Lake Michigan, Lake Huron.
Identifiers: Icebreakers.

The Great Lakes 1971-72 ice season was notable for an unseasonably warm fall and early winter, with an abrupt reversal in January to a colder than normal regime which persisted through midspring. The winter navigation season was again extended through January, and the navigation season was opened fairly early in the spring with the aid of intensive icebreaking operations conducted gy United States and Canadian icebreakers. The St. Lawrence Seaway officially shut down December 15, but the locks were kept open an additional week to permit the last of the 'salties' to return to the open sea. Conditions were bad in early March; however, navigation over the upper Lakes resumed late that month when icebreakers opened the Straits of Mackinac. Navigation over the upper Lakes was maintained with difficulty through April and early May. A cold spring retarded deterioration of the ice, and prolonged northeasterly winds jammed drift floe and brash ice onto the south and western sides of Lake Superior and the southern end of Lake Huron, and blocked the channels cut through the Straits and the Soo waterway. Constant icebreaker transits were needed to keep the traffic flowing. (NOAA)
W75-00376

THE 1972-73 GREAT LAKES ICE SEASON,
National Weather Service, Cleveland, Ohio.
For primary bibliographic entry see Field 2H.
W75-00378

ENERGY BALANCE OF LAKE ONTARIO,
National Ocean Survey, Detroit, Mich. Lake Survey Center; and Canada Centre for Inland Waters, Burlington (Ontario).
For primary bibliographic entry see Field 2H.
W75-00399

WINTER CONDITIONS IN LAKE ERIE WITH REFERENCE TO ICE AND THERMAL STRUCTURE AND COMPARISON TO LAKES WINNEBAGO (WISCONSIN), AND MILLE LACS (MINNESOTA),
State Univ. of New York, Buffalo. Dept. of Biology.
For primary bibliographic entry see Field 2H.
W75-00495

2D. Evaporation and Transpiration

SOYBEAN WATER USE IN THE SHELTER OF A SLAT-FENCE WINDBREAK,
Connecticut Univ., Storrs. Dept. of Plant Science.
For primary bibliographic entry see Field 3F.
W75-00016

HYDROLOGY OF LAKES SYMPOSIUM.
For primary bibliographic entry see Field 2H.
W75-00029

WATER BALANCE VARIABILITY OF LAKES ARAL, BALKHASH, ISSYK-KUL, AND CHANY,
For primary bibliographic entry see Field 2H.
W75-00046

WATER BALANCE OF LAKE PEIPSI-PIHKVA,
Tartu State Univ. (USSR).
For primary bibliographic entry see Field 2H.
W75-00049

THE WATER BALANCE AND THE LEVEL REGIME OF LAKE KHUBSUGUL (KOSOGOL),
Irkutskii Gosudarstvennyi Universitet (USSR).
For primary bibliographic entry see Field 2H.
W75-00050

WATER BALANCE OF LAKES IN DIFFERENT PHASES OF HUMIDIFICATION CYCLES,
For primary bibliographic entry see Field 2H.
W75-00051

THE WATER BALANCE OF LAKE BAIKAL,
Limnologicheskii Institut, Irkutsk (USSR).
For primary bibliographic entry see Field 2H.
W75-00052

WATER BALANCE OF THE LAKES AND RESERVOIRS OF THE CAUCASUS MINOR (WITHIN THE AZERBAIJAN SSR),
Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Institut Geografii.
For primary bibliographic entry see Field 2H.
W75-00056

EVAPORATION FROM THE LAKES IN FINLAND,
Finnish Meteorological Office, Helsinki.
R. Solantie.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 211-219, 1973. 4 fig, 1 tab, 8 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Lakes, Hydrology, Regression analysis.
Identifiers: *Finland, *Dalton type formula.

The mean of evaporation during open water from the lakes in the nine regions of Finland was calculated for the period 1951 to 1965 using a Dalton type formula. The evaporation during the time when the lakes are covered with ice was evaluated, giving the yearly total of evaporation ET as the sum of EL and EI. The resulting values for EL vary from 330 to 550 mm, for EI from 60 to 80 mm and for ET from 390 to 610 mm. The value of ET was also calculated from a regression analysis, giving an account of the evaporation from both land and water areas. The values of ET calculated by these two methods correspond very well. (See also W75-00029) (Humphreys-ISWS)
W75-00058

COMPARISON OF CALCULATION METHODS FOR EVAPORATION USING LAKE BALATON AS AN EXAMPLE,
National Meteorological Service, Budapest (Hungary).
E. Antal, S. Baranyi, and E. Toth.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 220-224, 1973. 3 fig, 8 ref.

Descriptors: *Evaporation, *Meteorology, *Vapor pressure, *Energy budget, Hydrology, Meteorological data, Saturation, Water, Water balance, Lakes.
Identifiers: *Energy balance, *Hungary(Lake Balaton), Evaporation formulae, Dalton's Law.

The evaporation of Lake Balaton, the largest lake in Central Europe, was calculated in six different ways. One way was by an empirical formula which included air temperature, vapor pressure, and wind velocity data from measuring stations situated on the shore. The results obtained by the equations of energy balance and water balance were approximately the same. The multiannual mean evaporation was estimated as 860 mm. Monthly and annual evaporation values were calculated, and comparisons of the results from the defferent methods were made. The long-term objective was to improve the empirical relation of Meyer's formula by using other energy and water balance data. (See also W75-00029) (Roberts-ISWS)
W75-00059

A COMPARISON OF SEVERAL METHODS OF ESTIMATING THE EVAPORATION OF LAKE FLEVO,
Royal Netherlands Meteorological Inst., De Bilt.
J. Q. Keijman, and R. W. R. Koopmans.

In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 225-232, 1973. 2 fig, 1 tab, 11 ref.

Descriptors: *Evaporation, *Meteorology, *Lakes, Evaporation pans, Precipitation(Atmospheric), Water levels, Water balance, Meteorological data.
Identifiers: *Vapor transfer, *Lake evaporation, *Netherlands(Lake Flevo), Computed evaporation, Lake radiation, Penman method, Pan factor, Vapor transfer, Meteorological methods.

Evaporation was computed for a large shallow lake according to the water balance method, the energy budget method, the bulk aerodynamic method, Penman's method and the pan factor method. Data for all meteorological methods were collected at one main station in the center of the lake. Precipitation and water levels were recorded with the Penman method at several other recording stations in and around the lake. The water balance method gave very accurate results for certain periods. The energy budget method compared most favorably with the water balance. The bulk aerodynamic method and the Penman method gave satisfactory results with an adapted empirical coefficient. The results of the pan factor method showed the largest errors. (See also W75-00029) (Roberts-ISWS)
W75-00060

A COMPARISON OF VARIOUS METHODS USED FOR THE DETERMINATION OF EVAPORATION FROM FREE WATER SURFACES,
Meteorologischer Dienst der Deutschen Demokratischen Republik, Berlin. Forschungsinstitut fuer Hydrometeorologie.
D. Richter.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 233-238, 1973. 1 fig, 4 tab, 5 ref.

Descriptors: *Evaporation, *Meteorology, *Evaporation pans, Hydrology, Evaporators, Cooling water, Reservoirs, Heat balance, Radiation, Lakes, Free surfaces.
Identifiers: *Waste heat, *German Democratic Republic(Lake Stechlin).

Comparisons were made of evaporation measured on rafts floating on Lake Stechlin, at the Pohl and Spremberg Dams, and at larger lakes in Mecklenburg, all in the German Democratic Republic. The data were obtained from evaporation pans, with missing data being completed by empirical values or by using the heat balance method. The results were summarized and the advantages and disadvantages of investigation methods compared. Also, preliminary results of the man-made effect on the evaporation of Lake Stechlin, a cooling water reservoir for a nuclear power plant, were presented in tabular form. (See also W75-00029) (Roberts-ISWS)
W75-00061

EVAPORATION FROM LAKE VELEN ESTIMATED FROM THE ENERGY BUDGET,
Uppsala Univ. (Sweden). Dept. of Physical Geography.
A. Rodhe.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 239-244, 1973. 1 fig, 3 tab, 5 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Energy budget, *Lakes, Solar radiation, Water temperature, Hydrologic budget, Hydrologic cycle, Precipitation(Atmospheric).
Identifiers: *Sweden(Lake Velen).

Daily evaporation from Lake Velen was estimated by the energy-budget method with data collected for other purposes. Net radiation measured over land was transformed to give net radiation over the lake. Daily heat storage was computed from 24 h mean temperatures at the center of the lake. The calculated evaporation was compared to pan measurements and the results of water-budget studies. (See also W75-00029) (Humphreys-ISWS)
W75-00062

THE LAKE VELEN PROJECT AND SOME OF ITS RESULTS,
International Hydrological Decade, Stockholm (Sweden). Swedish National Committee.
For primary bibliographic entry see Field 2H.
W75-00063

EVALUATION OF THE PENMAN METHOD FOR THE COMPUTATION OF EVAPORATION FROM WATER BODIES USING OBSERVED DATA,
Gosudarstvennyi Gidrologicheskii Institut, Leningrad (USSR).
Z. A. Vikulina.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 263-268, 1973. 2 tab, 5 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Reservoir evaporation, Lakes, Seasonal, Annual, Monthly, Heat balance.
Identifiers: *USSR, Penman evaporation equation.

An evaluation is presented of the Penman method for the computation of evaporation, together with methods accepted in the USSR. Tabulated results of evaporation values determined from an equation widely used in the USSR, heat balance calculations, and Penman method were given. For the USSR territory, the Penman method indicated a low accuracy of monthly evaporation computations, but acceptable errors of computation on annual estimates. Accordingly, the Penman method may be used for computation of annual evaporation only when no observational data, necessary for more detailed computations, are available. A closer agreement of evaporation values was obtained using the USSR equation and heat balance method, both of which reflect the actual hydrometeorological conditions of water bodies, according to their geographical location, size, and the extent to which they are studied. (See also W75-00029) (Humphreys-ISWS)
W75-00064

DETERMINATION OF EVAPORATION FROM LAKE AND RESERVOIR SURFACES USING THE HEAT BALANCE METHOD,
Main Geophysical Observatory, Leningrad (USSR).
T. V. Kirillova, T. A. Ogneva, and L. V. Nesina.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973. International Association of Hydrological Sciences Publication No 109, p 269-275, 1973. 7 tab, 13 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Heat balance, Reservoir evaporation, *Lakes, Hydrology, Equations, Reservoirs, Air temperature, Humidity, Wind velocity, Evaporation pans.
Identifiers: Water surface.

Some results were presented of a study on the development of methods for determining evaporation from lake and reservoir surfaces. The heat-balance equation formed the basis of these methods. Practical application of the relationships obtained requires the use of observation data from coastal meteorological and actinometric stations. The methods were used to calculate the values of water surface temperature taking into consideration the morphometric characteristics of reservoirs, as well as the values of air temperature, humidity, and wind speed over the water surface. For the calculation of evaporation a formula was suggested that includes the characteristics of heat and moisture exchange between the reservoir and the atmosphere. Comparison of the results of evaporation calculation by the method developed with the measurements from evaporation pans showed that in all cases, during the period of heating of a reservoir, the evaporation from evaporation pans was higher than that calculated for the reservoir. In the cooling period of the reservoir a reverse picture was observed, i.e., the evaporation from the pans was lower than that from the reservoir. In the transitional period from heating to cooling both methods gave close agreement. (See also W75-00029) (Humphreys-ISWS)
W75-00065

WATER BALANCE OF LAKES PYHAJARVI AND PAAJARVI,
National Water Board of Finland, Helsinki.
For primary bibliographic entry see Field 2H.
W75-00066

EVAPORATION FROM SMALL WATER RESERVOIRS,
Polish Academy of Sciences, Golysz. Fish Culture Station.
M. Szumiec.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 284-289, 1973. 4 fig, 2 tab, 9 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Reservoir evaporation, Ponds, Diurnal distribution, Seasonal, Lakes.
Identifiers: *Poland, Fish ponds.

Diurnal and seasonal distributions of water evaporation rates from fish ponds and variations in parameters which determine the evaporation process were presented. Harmonic analyses pointed to the possibility of representing the time distributions of the surface water vapor flux, as well as the vertical lapse rate of water vapor pressure over the small reservoirs, in the form of simple trigonometrical functions. A comparison was made of monthly sums of evaporated water and the vertical turbulent exchange coefficient of mass over ponds as well as over lakes. The empirical formula determining the rate of evaporation from ponds was defined. (See also W75-00029) (Humphreys-ISWS)
W75-00067

EXPERIENCES WITH EVAPORATION PANS AT A SHALLOW STEPPE-LAKE IN AUSTRIA,
Zentralanstalt fuer Meteorologie und Geodynamik, Vienna (Austria).
F. Neuwirth.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 290-297, 1973. 1 fig, 10 tab, 11 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Evaporation pans, *Lakes, Seasonal, Diurnal, Annual, Monthly, Waves(Water), Winds.
Identifiers: *Austria(Lake Neusiedl), Steppe-lake, Webb's method.

Experiences with evaporation pans used at a shallow lake were reported. The GGI-3000 pan, floating with the aid of a raft in the middle of the lake was very much disturbed during high wind speeds greater than 25 km/h. As a compensation a rinsed GGI-3000 pan set up on the shore which is washed by the lake water with the aid of a pump, can be

recommended. The applicability of empirical evaporation formulae for the interpolation of missing or incorrect values of evaporation from the class-A pan was investigated. The differences in the mechanism of evaporation from the class-A pan, and from the lake during different weather situations were discussed. Results of calculations were given for evaporation from the lake, based on the evaporation of the class-A pan, using Webb's method. (See also W75-00029) (Humphreys-ISWS)
W75-00068

MODIFIED PENMAN METHOD FOR POTENTIAL EVAPOTRANSPIRATION FROM FOREST REGIONS,
Department of the Environment, Ottawa (Ontario). Inland Waters Branch.
S. Y. Shiau, and K. S. Davar.
J Hydrol (Amst). Vol 18, No 3/4, p 349-365, 1973. Illus.

Descriptors: *Evapotranspiration, Forests, Soil moisture, Evaporation, Methodology, Instrumentation.
Identifiers: Penman method.

Penman's combination mass transfer and energy balance method for estimating evapotranspiration was modified for application to a forest environment. The modified method was developed and applied to the North Nashwaaksis stream basin in New Brunswick, Canada. About 85% of the North Nashwaaksis stream basin is covered by forest. The climate in this basin is classified as a humid continental type; the soil moisture in the root zone of the forest is almost always unlimited (i.e., rarely less than field capacity). Hence, the potential evapotranspiration (PEf) is a good estimation of the actual evapotranspiration (AEf) in this area. The ratio of potential evapotranspiration to pan evaporation, designated as the pan coefficient K, for the forest covered areas at different locations in New Brunswick is also presented for practical applications. The results of evaporation and potential evapotranspiration estimated by other methods are also presented for comparison. The results show that about 52% of the total precipitation in the North Nashwaaksis stream basin was lost due to potential evapotranspiration during the frost free season (April-Oct.) each year. The normal seasonal water loss (April-October) by potential evapotranspiration from forest areas at other locations in New Brunswick ranged from 50 - 60%.--Copyright 1974, Biological Abstracts, Inc.
W75-00210

EVAPORATION-CONDENSATION AND SNOWMELT MEASUREMENTS IN FINLAND,
Finish Hydrological Office, Helsinki.
R. Lemmela, and E. Kuusisto.
Nordic Hydrology, Vol 5, No 1, p 64-74, 1974. 5 fig, 3 tab, 10 ref.

Descriptors: *Evaporation, *Condensation, *Snowmelt, Water equivalent, Snow surveys, Regression analysis, Evaporation pans, Snow cover, Meteorology, Melting, On-site investigations, Model studies, Density.
Identifiers: *Finland, Snow pillow, Sncw water, Drip pans.

Measurements on evaporation and the melting of snow cover were made during the period 1968-1973 on an experimental field in southern Finland. An explanation of how the measured values depended on meteorological factors and the structure of the snow was given. The snow depth was determined by reading 25 snow stakes on the experimental field. The snow density was determined with snow scales having a cylinder with a 100 sq cm cross section. The measurements showed that the dispersion of the water equivalent values remained constant from 5 to 7% during the winter. The dispersion started to increase noticeably as the snow melted, and increased to 30-40% at the end of the snowmelt. The regression analysis of the evaporation gave no motive for the use of a non-linear wind function. A theoretical model based on the energy balance had been sought with the aim of explaining snowmelt. However, a simple model containing certain basic parameters gave better results. (Roberts-ISWS)
W75-00323

THE INFLUENCE OF CLOUDINESS ON THE NET RADIATION BALANCE OF A SNOW SURFACE WITH HIGH ALBEDO,
Innsbruck Univ. (Austria). Physikalisches Institut.
For primary bibliographic entry see Field 2C.
W75-00324

HEAT EXCHANGE OVER A MELTING SNOW SURFACE,
Centre National de la Recherche Scientifique, Grenoble (France). Laboratoire de Glaciologie.
For primary bibliographic entry see Field 2C.
W75-00327

PLANT-WATER MEASUREMENTS ON SOYBEANS SHELTERED BY TEMPORARY CORN WINDBREAKS,
Agricultural Research Service, Morris, Minn. North Central Soil Conservation Research Center.
For primary bibliographic entry see Field 3F.
W75-00525

2E. Streamflow and Runoff

A STUDY OF WATER LEVEL VARIATIONS IN ENCLOSED RESERVOIRS BY MEANS OF STOCHASTIC MODELS OF THE WATER BALANCE CONSTITUENTS,
I. Zhdanova, V. Privalsky, and D. Ratkovich.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 182-184, 1973. 1 tab, 6 ref.

Descriptors: *Water balance, *Surface-groundwater relationships, *Markov processes, *Evaporation, *Water level fluctuations, Base flow, Reservoirs, Stochastic processes, Discharge(Water), River flow, Lakes.
Identifiers: *Caspian Sea(USSR).

According to experimental results, year-to-year variations of river runoff represent a stationary random process whose joint distribution density function follows a special form. The same stochastic process was assumed to describe net evaporation from the surface of the reservoir, while underground discharge is assumed to be constant. This approach permits the evaluation of basic parameters of water level variations using the equation of water balance. When the stochastic models of river runoff and net evaporation are determined, the properties of water level variations can be studied either analytically or experimentally. In particular, it is possible to forecast variations of water level, to estimate the forecast errors, and, if need be, to allow for any water management arrangemennts. (See also W75-00029) (Sanderson-ISWS)
W75-00054

MAGNETIC FLOWMETER THAT KEEPS ITS NOSE CLEAN,
For primary bibliographic entry see Field 7B.
W75-00133

RUNOFF CONDITIONS, CALCULATION METHODS, DIMENSIONING CRITERIA (ABFLUSSVERHAELTNISSE, BERECHNUNGSMETHODEN, DIMENSIONIERUNGSGRUNDSAETZE),
W. Stetefeld.
Wasser-und Energiewirtschaft, Vol 66, No 4/5, p 139-142, 1974. 1 fig, 1 tab.

Descriptors: *Runoff forecasting, *Model studies, *Flood protection, Floods, Sediment, Topography, Climatic data, Precipitation(Atmospheric).
Identifiers: *Switzerland, Calculations.

Runoff conditions, as well as calculation methods and dimensioning criteria for flood protection are discussed with special regard to the conditions prevailing in Switzerland. The runoff as part of the overall water budget is influenced by such factors as climate, the nature of the underground and rocks, vegetation, and topography. Rocks and ground have a certain buffer capacity for water runoff, while vegetation tends to intercept precipitation. A general formula for flood calculation determines runoff quantity as a product of the specific runoff and the surface of the water capture area. The storm runoff is determined as the product of the runoff coefficient, surface area, and rain intensity. Runoff and flood protection systems in Switzerland are dimensioned for floods with a probability of occurrence of one every 100 years. The freeboard for flood protection systems is usually set at one m with respect to waves, sediment formation, ice drift and other phenomena impeding normal runoff. (Takacs-FIRL)
W75-00140

SURFACE WATER POLLUTION BY THE DISCHARGE OF COMBINED SEWER SYSTEMS (POLLUTION DES EAUX DE SURFACE PAR LE DECHARGE DES RESEAUX D'EGOUT UNITAIRES),
For primary bibliographic entry see Field 2A.
W75-00141

WATER RESOURCES OF THE KETTLE RIVER WATERSHED, EAST-CENTRAL MINNESOTA,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00217

WATER RESOURCES OF THE COTTONWOOD RIVER WATERSHED, SOUTHWESTERN MINNESOTA,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00218

WATER RESOURCES OF WISCONSIN, PECATONICA-SUGAR RIVER BASIN,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00219

THE 1971 DROUGHT IN SOUTH FLORIDA AND ITS EFFECT ON THE HYDROLOGIC SYSTEM,
Geological Survey, Tallahassee, Fla.
For primary bibliographic entry see Field 2A.
W75-00220

FLOOD PROFILES AND INUNDATED AREAS ALONG THE WHITE RIVER, CHELAN COUNTY, WASHINGTON,
Geological Survey, Tacoma, Wash.
J. Savini, C. F. Schneider, and D. E. LaFrance.
Available from NTIS, Springfield, Va 22161 as PB-235 065/AS, $3.25 printed copy; $2.25 microfiche. Water-Resources Investigations 13-74, 1974. 11 p, 3 fig, 2 tab.

Descriptors: *Flood profiles, *Floods, *Flood plains, *Washington, Stage-discharge relations, Discharge(Water), Flood recurrence interval.
Identifiers: *White River(Wash).

Flood profiles of the main stem to river mile 11.0 of the White River in Chelan County, Wash., are

presented. Flood-frequency curves based on an average of a regional computation and a Log-Pearson Type III analysis of 18 years of record indicate that the 100-year flood will have a discharge of about 6,600 cubic feet per second at river mile 6.4. Discharge of a 50-year flood was computed to be about 6,300 cfs. The greatest flood discharge during the study period occurred on June 10, 1972, and was 5,310 cfs; such a discharge has a recurrence interval of 4 years. Most of the flood plain of the White River probably is inundated during a 100-year flood. (Knapp-USGS)
W75-00221

WATER RESOURCES OF THE COLVILLE INDIAN RESERVATION, WASHINGTON,
Geological Survey, Tacoma, Wash.
R. E. Harkness, D. A. Myers, and G. C. Bortleson.
Open-file report, 1974. 149 p, 17 fig, 17 tab, 15 ref, 9 append.

Descriptors: *Water resources, *Surface waters, *Groundwater, *Washington, Columbia River, Indian reservations, Hydrologic data, Data collections, Water quality, Basic data collections, Water yield.
Identifiers: *Colville Indian Reservation(Wash).

The water resources of the Colville Indian Reservation were evaluated. Data collected include the amount of water flowing in streams, the general occurrence and availability of groundwater, the quality of ground and surface waters, including that of selected lakes, and the current water usage. The Columbia River provides a major source of water for use on the reservation, as well as for recreational and other water-based activities. The flow of the Columbia River averages about 76 million acre-ft per yr. The Okanogan River valley is underlain by a large body of water-bearing sand and gravel that extends about 40 miles along the western fringe of the reservation. The terraces that border the Columbia River are similar to those bordering the Okanogan River and are underlain by sand, gravel, and silt, with the higher terraces having the finer grained material. For future development, properly located and constructed wells could pump sufficient water to supply most of the irrigable land within this area, probably with no harmful effect from the increased pumpage. (Knapp-USGS)
W75-00226

KANSAS STREAMFLOW CHARACTERISTICS: PART 10. SELECTED STREAMFLOW CHARACTERISTICS AS RELATED TO ACTIVE-CHANNEL GEOMETRY OF STREAMS IN KANSAS,
Geological Survey, Lawrence, Kans.
E. R. Hedman, W. M. Kastner, and H. R. Hejl.
Kansas Water Resources Board Technical Report No 10, June 1974. 21 p, 6 fig, 2 tab, 9 ref.

Descriptors: *Flood frequency, *Channel morphology, *Kansas, Regression analysis, Correlation analysis, Precipitation(Atmospheric), Data collections, Statistics, Drainage area, Watersheds(Basins).

Flood-frequency characteristics and mean annual runoff values were analyzed for Kansas streams. The equations (derived by regression analyses) were based on the flow characteristics, dimensions of active-channel geometry, a drainage-area parameter, and precipitation parameters. Data for 40 continuous-record and 80 partial-record high-flow gaging stations were used for deriving flood-frequency equations. Data for the 40 continuous-record gaging stations alone were used in deriving the mean annual runoff equations. For the flood frequencies of 2, 5, 10, 25, 50 and 100 years the standard errors of estimate using the active-channel width alone ranged from 44% to 62%. When the width, drainage area, and precipitation parameters were included, the standard errors of estimate ranged from 40% to 54%. The equation relating the mean annual runoff to active-channel width alone had a standard error of estimate of 62%; standard error of estimate was 25% when drainage area and a precipitation parameter were included. (Knapp-USGS)
W75-00227

WATER RESOURCES DATA FOR KANSAS, 1973: PART 1. SURFACE-WATER RECORDS,
Geological Survey, Lawrence, Kans.
M. L. Thompson, and R. E. Curtis, Jr.
Basic-Data Report, 1974. 202 p, 2 fig, 3 ref.

Descriptors: *Basic data collections, *Hydrologic data, *Surface waters, *Kansas, Streamflow, Stream gages, Stage-discharge relations, Reservoirs, Rivers, Streams, Lakes.

Surface-water records for the 1973 water year for Kansas, including records of streamflow or reservoir storage at gaging stations and partial-record stations, are presented. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Kansas. The base data collected at gaging stations consists of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. (Knapp-USGS)
W75-00234

HYDROLOGIC DATA OF THE JUNE 1972 FLOOD IN PENNSYLVANIA,
Geological Survey, Harrisburg, Pa.
R. A. Miller.
Pennsylvania Department of Environmental Resources, Harrisburg, Water Resources Bulletin No 9, August 1974. 97 p, 36 fig, 8 tab, 1 ref.

Descriptors: *Flood data, *Hurricanes, *Pennsylvania, *Data collections, Basic data collections, *Hydrologic data, Flood profiles, Discharge(Water), Stage-discharge relations, Hydrographs, Rainfall, Peak discharge, Precipitation(Atmospheric).

On June 22 and 23, 1972, the most severe flood ever recorded in central Pennsylvania took place. General flooding occurred throughout the Commonwealth with the most extreme conditions taking place in the Susquehanna River basin. Tropical Storm Agnes, which was born June 16, 1972, in the Gulf of Mexico, was responsible for the flooding. This report is a compilation of hydrologic data resulting from the storm. Meteorological data and summaries of the flood peaks at gaging sites and partial-record sites are presented. Discharge hydrographs are given for several stream-gaging stations near the boundary of the Commonwealth and near urban areas devastated by the flood. Stream-profile data were ascertained by level surveys of high-water marks. (Knapp-USGS)
W75-00235

SPATIALLY VARIED SUBCRITICAL AND SUPERCRITICAL FLOW IN GULLIES,
Kentucky Univ., Lexington. Water Resources Research Inst.
For primary bibliographic entry see Field 2J.
W75-00269

VARIATIONS IN THE NATURAL CHEMICAL CONCENTRATION OF RIVER WATER DURING FLOOD FLOWS, AND THE LAG EFFECT,
Newcastle-upon-Tyne Univ. (England). Dept. of Civil Engineering.
B. J. Glover, and P. Johnson.
Journal of Hydrology, Vol 22, No 3-4, p 303-316, 1974. 8 fig, 1 tab, 10 ref.

Descriptors: *Flood waves, *Convection, *Mixing, *Hydrographs, *River flow, Channels, Dispersion, Flood flow, Water circulation, Rivers, Laboratory tests, Calcium carbonate, Bicarbonates, On-site investigations.
Identifiers: *United Kingdom(South Tyne River), Chemographs, Kinematic wave theory, Lag effect, Hydrochemical lag.

Explanations were sought for variations in concentrations of dissolved chemicals with the rise in discharge of a large river. Hourly sampling on the South Tyne River showed variations in the concentration of dissolved constituents to lag behind associated changes in discharge. This lag occurred because flood wave velocity exceeded mean water velocity. The phenomenon was confirmed by laboratory experiments in a long channel. Lag times were defined as the delay of the start of the drop in concentration on the chemograph behind the start of the rise in discharge for the laboratory channel studies; and as the difference in time between the points at which 50% of the total rise in discharge and 50% of the total drop in concentration occurred for the river study. Additional conclusions were: lag time was longer for small rises in discharge because of their slower channel speeds; the lag was only noticeable for large catchments and was generally undetectable by hourly sampling methods in catchment areas of less than 100 sq km; and, a single sample, if taken at a distance of 3 m, or more, from either stream bank was representative of the mean concentration in the cross-section. (Harmeson-ISWS)
W75-00320

A SATELLITE-TRACKED BUOY IN THE AGULHAS CURRENT,
Natal Univ., Durban (South Africa). Oceanographic Research Inst.
For primary bibliographic entry see Field 7B.
W75-00330

NUMERICAL PROPERTIES OF IMPLICIT FOUR-POINT FINITE DIFFERENCE EQUATIONS OF UNSTEADY FLOW,
Weather Bureau, Washington, D.C. Office of Hydrology.
D. L. Fread.
NOAA Technical Memorandum NWS HYDRO-18, March 1974. 38 p, 15 fig, 19 ref.

Descriptors: *River flow, Rivers, Reservoirs, Estuaries.
Identifiers: *River discharge, *Numerical properties.

Linearized model equations of the quasi-linear differential equations of unsteady gradually varied flow are utilized to investigate the effect of the discretization of the continuous partial derivatives with implicit four-point finite difference quotients. Through use of a weighting factor which positions the spatial difference quotient between adjacent time levels in the x-t solution region, the investigation is generalized to include the various four-point implicit difference schemes that have been reported in the literature. The convergence properties are quantitatively investigated by determining analytical expressions for wave damping and wave celerity convergence ratios, e.g., numerical damping/physical wave damping. The box scheme is shown to possess superior convergence properties compared to the backward implicit scheme particularly with respect to wave damping. On the basis of convergence properties, the box scheme is shown to be the preferred implicit four-point difference scheme for discretizing the differential equations of unsteady flow. (NOAA)
W75-00380

TSUNAMI PROPAGATION AND RESPONSE TO COASTAL AREAS,
Hawaii Inst. of Geophysics, Honolulu.
For primary bibliographic entry see Field 2J.
W75-00480

A DYNAMIC MODEL OF STAGE-DISCHARGE RELATIONS AFFECTED BY CHANGING DISCHARGE,
National Weather Service, Silver Spring, Md. Office of Hydrology.
For primary bibliographic entry see Field 4A.
W75-00493

WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
M. Sniedovich, D. R. Davis, and L. Duckstein.
Final Report, July 1974. 92 p, 1 fig, 9 tab, 106 ref, 2 append.

Descriptors: *Floods, *Flood forecasting, *Hydrologic data, Model studies.

The factors affecting the evaluation of short-term flood forecasts, which were developed previously, are put into a formal decision model. The forecasting-response process is viewed as a stochastic multistage decision process. Decisions as to the response to flood forecasts are made sequentially in time on the basis of the information available and the state of the overall system at each decision time. This model is based on adaptive control theory; computation is done by the dynamic programming algorithm. The data and other input requirements of models are discussed. A one stage simplification of the model is developed for illustration and to provide a numerical example. It is shown that the decision model developed may serve as a tool for the design and evaluation of flood forecasting systems. The implications of the systems decision approach to a flood forecasting system are discussed with special emphasis on forecasting policy (the timing and type of forecasts). (NOAA)
W75-00515

FLOOD PLAIN INFORMATION: GLACIER CREEK, GIRDWOOD, ALASKA.
Army Engineer District, Anchorage, Alaska.
For primary bibliographic entry see Field 4A.
W75-00539

FLOOD PLAIN INFORMATION; CHATTAHOOCHEE RIVER, BUFORD DAM TO WHITESBURG, GEORGIA.
Army Engineer District, Mobile, Ala.
For primary bibliographic entry see Field 4A.
W75-00540

FLOOD PLAIN INFORMATION: NEABSCO CREEK AND COW BRANCH, PRINCE WILLIAM COUNTY, VIRGINIA,
Army Engineer District, Baltimore, Md.
For primary bibliographic entry see Field 4A.
W75-00542

FLOOD PLAIN INFORMATION: EAST BRANCH BRANDYWINE CREEK, (DOWNINGTOWN TO THE JUNCTION OF EAST AND WEST BRANCHES) CHESTER COUNTY, PENNSYLVANIA,
Army Engineer District, Philadelphia, Pa.
For primary bibliographic entry see Field 4A.
W75-00543

SPECIAL FLOOD HAZARD INFORMATION REPORT; COOSA RIVER-ETOWAH RIVER-OOSTANAULA RIVER, ROME, FLOYD COUNTY, GEORGIA,
Army Engineer District, Mobile, Ala.
For primary bibliographic entry see Field 4A.
W75-00544

FLOOD PLAIN INFORMATION: DE NEVEU CREEK, FOND DU LAC RIVER, MAIN STEM - EAST BRANCH - WEST BRANCH, FOND DU LAC COUNTY, WISCONSIN,
Army Engineer District, Chicago, Ill.
For primary bibliographic entry see Field 4A.
W75-00545

FLOOD PLAIN INFORMATION: PENNYPACK CREEK, (MEADOW BROOK, SOUTHHAMPTON CREEK, HUNTINGDON VALLEY CREEK, BLAIR MILL RUN) MONTGOMERY COUNTY, PA,
Army Engineer District, Philadelphia, Pa.
For primary bibliographic entry see Field 4A.
W75-00546

FLOOD PLAIN INFORMATION; SHEBOYGAN RIVER AND MULLET RIVER, SHEBOYGAN COUNTY, WISCONSIN.
Army Engineer District, Chicago, Ill.
For primary bibliographic entry see Field 4A.
W75-00547

FLOOD PLAIN INFORMATION, CUMBERLAND RIVER AND STRAIGHT CREEK, PINEVILLE, KENTUCKY.
Army Engineer District, Nashville, Tenn.
For primary bibliographic entry see Field 4A.
W75-00548

FLOOD PLAIN INFORMATION, LEMON CREEK, JUNEAU, ALASKA,
Army Engineer District, Juneau, Alaska.
For primary bibliographic entry see Field 4A.
W75-00549

FLOOD PLAIN INFORMATION: FARMINGTON BAY TRIBUTARIES, FARMINGTON-CENTERVILLE, UTAH,
Army Engineer District, Sacramento, Calif.
For primary bibliographic entry see Field 4A.
W75-00550

2F. Groundwater

ANNUAL VARIATION OF SEEPAGE OF LAKES IN THE MORAINE AREA OF THE GERMAN DEMOCRATIC REPUBLIC,
Meteorologischer Dienst der Deutschen Demokratischen Republik, Berlin. Forschungsinstitut fuer Hydrometeorologie.
For primary bibliographic entry see Field 2H.
W75-00041

INFLOW TO LAKES OF THE SEMIARID ZONE OF THE USSR FROM GROUNDWATER,
L. A. Zemljanitzyna.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helisinki, Finland, International Association of Hydrological Sciences Publication No 109, p 185-190, 1973. 6 ref.

Descriptors: *Water balance, *Surface-groundwater relationships, *Base flow, *Lakes, *Water chemistry, Groundwater, Inflow, Hydrologic cycle, Subsurface flow, Semiarid climates.
Identifiers: *USSR, Lake Kulunda, Lake Kuchuk, Lake Tanatar, Alakol Lakes, Lake Sasykkol, Lake Zheltavkol, Lake Teke, Lake Kizylkak, Lake Seletyteniz.

Although the character and the role of groundwater flow into lakes are the most important factors influencing the streamflow regime of lakes of semiarid zones, comparatively little is known of the subject. Investigations of the lakes of the semiarid zone were classified into three general groups based on the significance of groundwater flow to their water balance. Comparison of the ion composition and mineralization of the lake and groundwaters showed that the composition of groundwaters feeding the lake has a significant effect on the lake-water chemistry. From existing quantitative determinations of groundwater flow made by direct measurements and by calculation together with measurements of water chemistry, it is possible to determine the role of groundwater feeding lakes for which no data are available. Examples were given of lakes of different types. Lakes were classified in groups according to their water chemistry and hydrodynamic characteristics. (See also W75-00029) (Sanderson-ISWS)
W75-00055

STUDYING THE ROLE OF GROUNDWATER FLOW IN WATER AND SALT BALANCES OF LAKES,
Akademiya Nauk SSSR, Moscow. Institut Vodnykh Problem.
I. S. Zektzer.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 197-201, 1973. 11 ref.

Descriptors: *Water balance, *Surface-groundwater relationships, *Base flow, *Lakes, *Lake basins, Dissolved solids, Subsurface flow, Hydrologic cycle, Inflow, Water chemistry, Sulfates, Chlorides, Sodium, Salt balance, Groundwater movement.
Identifiers: *USSR, Lake Ladoga, Lake Baikal, Lake Balkhash, Caspian Sea.

Direct quantitative estimates of groundwater discharge into lakes enable the role of groundwater flow in the water and salt balances of lakes and in formation of their temperature regime to be determined. The following methods of estimating groundwater discharge into lakes were presented: the hydrodynamic method (modelling included using data on hydrogeological parameters of main aquifers; the combined hydrological and hydrogeological method for obtaining quantitative characteristics of groundwater flow; and the method of calculating groundwater flow based on the analysis of the data on the groundwater regime in the coastal area of the lake basin. Also methods for estimating areas of underwater discharge of groundwater into lakes using data on anomalies in water and lake bottom deposits were briefly discussed. The possible applications of the above methods are shown by examples for a number of large lakes: Ladoga, Baikal, Balkhash, and the Caspian Sea. (See also W75-00029) (Sanderson-ISWS)
W75-00057

INFLUENCE OF BOUNDARY RESISTANCE ON MEASUREMENTS OF UNSATURATED HYDRAULIC CONDUCTIVITY WITH THE DOUBLE MEMBRANE PRESSURE APPARATUS, (IN GERMAN),
Niedersaechsisches Landesamt fuer Bodenforschung, Hanover (West Germany).
M. Renger, W. Giesel, and O. Strebel.
Z Pflanzenernaehr Bodenkd, Vol 133, No 1/2, p 99-102, 1972, Illus, English summary.

Descriptors: *Groundwater, Instrumentation, Boundary processes, Hydraulics, Tensiometers, Measurements, *Hydraulic conductivity.
Identifiers: Double membrane apparatus.

Measurements of the unsaturated hydraulic conductivity with a double membrane apparatus showed that it is essential to consider the boundary resistance between ceramic plates and soil. Without considering this resistance the calculated k-values reach in average only 75% of the real k-value. To eliminate the influence of boundary resistance the hydraulic head difference between 2 points is measured directly with small tensiometers installed in the core sample between the upper and lower plate.--Copyright 1974, Biological Abstracts, Inc.

W75-00121

THE USE OF ARTIFICIAL RADIOACTIVE TRACERS FOR THE SOLUTION OF HYDROLOGICAL PROBLEMS (DIE VERWENDUNG KUENSTLICHER RADIOAKTIVER MARKIERUNGEN ZUR LOESUNG HYDROLOGISCHER PROBLEME),
H. Batsche, and F. Neumaier.
Oesterreichische Wasserwirtschaft, Vol 26, No 3/4, p 80-89, March-April, 1974. 7 fig, 11 ref.

Descriptors: *Tracers, *Hydrologic aspects, *Karst hydrology, *Groundwater, Flow velocity, *Filtration rate, Precipitation, Soils, Pumping, Flow rates, *Path of pollutants.
Identifiers: Single-hole methods, Multiple-hole methods, Percolation.

The practical uses of the radioactive tracer technique according to the single-hole and multiple hole methods for the solution of hydrological and hydrogeological problems are reviewed. The radioactive tracer technique according to the single-hole method was successfully used for the determination of the flow velocity and the rate of filtration of groundwater, for the study of the influence of groundwater table lowering on adjacent groundwater sheets, and for the determination of the vertical upward flow of groundwater. Such investigations may be necessary for the planning and underground structures and dams. The radioactive tracer method is also suitable for the measurement of water evaporation from the ground, and of the vertical rate of percolation of precipitation through different types of soils. The multiple-hole method was used for the identification of karst water and groundwater in an area used both for water capture and waste water disposal. Good agreement of the flow rates as determined by the single-hole and multiple-hole methods as well as those calculated from pumping tests was established. (Takacs-FIRL)
W75-00163

THE SIGNIFICANCE OF ISOTOPIC MEASUREMENTS FOR COMBINED KARST WATER STUDIES (DIE BEDEUTUNG VON ISOTOPENMESSUNGEN IM RAHMEN KOMBINIERTER KARSTWASSERUNTERSUCHUNGEN),
H. Zojer, and J. Zoetl.
Oesterreichische Wasserwirtschaft, Vol 26, No 3/4, p 62-70, March-April, 1974. 9 fig, 3 tab, 8 ref.

Descriptors: *Hydrological aspects, *Karst hydrology, *Tracers, Watersheds(Basins), Computers, Tritium, *Path of pollutants, Isotopes, *Groundwater.
Identifiers: Uranine, Lycopodium spores, Water movement.

The significance of isotopic tracer measurements is demonstrated by the example of complex hydrological studies of the karst waters in the Central Styrian Karst. It was possible to quantitatively determine the passage of water from one creek into another and the complex communications among these creeks in the karst area by tracer investigations using uranine, tritium and Lycopodium spores. The tracer technique permitted the determination of the distribution of precipitation among the creeks and the delimitation of the individual watershed areas. A computer model of the individual watershed systems was set up on the basis of the tritium tracing results. (Takacs-FIRL)
W75-00164

THE USE OF ARTIFICIAL RADIOACTIVE TRACERS FOR THE SOLUTION OF HYDROLOGICAL PROBLEMS. PART I: METHODS (DIE VERWENDUNG KUENSTLICHER RADIOAKTIVER MARKIERUNGEN ZUR LOESUNG HYDROLOGISCHER PROBLEME. TEIL I: METHODIK),
H. Moser.
Oesterreichische Wasserwirtschaft, Vol 26, No 3/4, p 75-80. April, 1974. 6 fig, 10 ref.

Descriptors: *Tracers, *Hydrologic aspects, *Groundwater movement, *Flow rate, Measurement, Flow velocity, *Tritium, *Path of pollutants.
Identifiers: Single-hole method, Scintillation counters.

A general description is given of the artificial radioactive tracing method suitable for the solution of hydrological problems. It is possible to determine the motion of water within unsaturated ground by injecting tritium and determining the radioactivity of earth samples taken in a vertical profile. The results thus obtained allow conclusions on the conditions of groundwater formation. The radioactive tracer technique works according to the single-hole method. The groundwater flow rate is determined from the dilution of the radioactive tracer, from the groundwater flow direction by the use of direction-sensitive scintillation counters, and from the measurement of the velocity and yield of vertical streams. (Takacs-FIRL)
W75-00165

CONSIDERATIONS ON ARTIFICIAL GROUNDWATER RECHARGE (NACHDENKLICHES ZUR KUENSTLICHEN GRUNDWASSERANREICHERUNG),
For primary bibliographic entry see Field 4B.
W75-00166

DECONTAMINATE WATER BEFORE IT GETS INTO THE GROUND,
Geraghty and Miller, Port Washington, N.Y.
For primary bibliographic entry see Field 5B.
W75-00208

WATER RESOURCES OF THE KETTLE RIVER WATERSHED, EAST-CENTRAL MINNESOTA,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00217

WATER RESOURCES OF THE COTTONWOOD RIVER WATERSHED, SOUTHWESTERN MINNESOTA,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00218

WATER RESOURCES OF WISCONSIN, PECATONICA-SUGAR RIVER BASIN,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00219

GROUND-WATER CONDITIONS IN UTAH, SPRING OF 1974,
Geological Survey, Salt Lake City, Utah.
J. C. Stephens.
Utah Division of Water Resources, (Salt Lake City), Cooperative Investigations Report No 13, 1974. 72 p, 39 fig, 2 tab, 12 ref.

Descriptors: *Groundwater, *Utah, *Basic data collections, Hydrologic data, Water balance, Water levels, Withdrawal, Irrigation water, Alluvium, Aquifers, Snowpacks, Runoff.

This is the eleventh in a series of annual reports that describe groundwater conditions in Utah. Information is presented on well construction, groundwater withdrawals, water-level changes, and related changes in precipitation and streamflow. Supplementary data such as graphs showing chemical quality of water and maps showing water-table configuration are included. Small quantities of groundwater can be obtained from wells throughout much of Utah, but large supplies that are of suitable chemical quality for irrigation, public supply, or industrial use can be obtained only in some areas. Less than 2 percent of the wells in Utah obtain water from consolidated rocks. Most wells that tap unconsolidated rocks are in large alluvial basins. The estimated total withdrawal of water from wells in Utah in 1973 was about 714,000 acre-feet, about 83,000 acre-feet less than in 1972, but more than 40,000 acre-feet greater than the average annual withdrawal for the period 1963-72. Both the decrease from 1972 and the increase over the 10-year average were due primarily to changes in withdrawals for irrigation. Runoff was above average in both volume and duration in much of the State. Groundwater recharge from streams was increased, pumping for irrigation was curtailed, and more surface water was used for irrigation. In addition, precipitation during the growing season was above average. Water levels rose generally in most major groundwater basins in the southern two-thirds of the state. (Knapp-USGS)
W75-00225

WATER RESOURCES OF THE COLVILLE INDIAN RESERVATION, WASHINGTON,
Geological Survey, Tacoma, Wash.
For primary bibliographic entry see Field 2E.
W75-00226

THE WATERS OF HOT SPRINGS NATIONAL PARK, ARKANSAS--THEIR ORIGIN, NATURE, AND MANAGEMENT,
Geological Survey, Little Rock, Ark.
M. S. Bedinger, F. J. Pearson, Jr., J. E. Reed, R. T. Sniegocki, and C. G. Stone.
Open-file report, 1974. 102 p. 14 fig, 12 tab, 40 ref.

Descriptors: *Hot springs, *Arkansas, *Water chemistry, Radiochemical analysis, Water temperature, Structural geology, Geothermal studies, Springs, Water yield, Thermal water, Thermal springs.
Identifiers: *Hot Springs(Ark).

The 47 hot springs of Hot Springs National Park, Ark., issue from the plunging crestline of a large overturned anticline, along the southern margin of the Ouachita anticlinorium. The springs emerge from the Hot Springs Sandstone near the anticlinal axis, between the traces of two thrust faults that are parallel to the axis of the anticline. The combined flow of the hot springs ranges from 750,000 to 950,000 gpd. Flow is highest in the winter and spring and is lowest in the summer and fall. The temperature of the combined hot springs water is about 62 deg Celsius. The radioactivity and chemical concentration of the hot springs are similar to that of cold-water springs and wells in the area. The dissolved-solids concentrations of the waters in the area generally range from 175 to 200 mg/liter. High silica concentration of the hot springs is due to the increased solubility of silica in hot water. Tritium and C-14 analyses of the water indicate that the water is a mixture of a very small amount of water less than 20 years old and a preponderance of water about 4,400 years old. Geochemical data, flow measurements, and geologic structure of the region support the concept that virtually all the hot-springs water is local, meteoric water. Recharge to the hot-springs artesian flow system is by infiltration of rainfall. The water moves slowly to depth where it is heated by contact with rocks of high temperature. Highly permeable zones, related to jointing or faulting, collect the heated water in the aquifer and provide avenues for the water to travel rapidly to the surface. (Knapp-USGS)
W75-00231

SUMMARY OF THE GROUND-WATER RESOURCES OF THE JAMES RIVER BASIN, VIRGINIA,
Geological Survey, Richmond, Va.
For primary bibliographic entry see Field 4B.
W75-00236

HYDROLOGY OF THE DISMAL SWAMP, VIRGINIA-NORTH CAROLINA,
Geological Survey, Richmond, Va.
W. F. Lichtler, and P. N. Walker.
Open-file report 74-39, 1974. 50 p, 15 fig, 5 tab, 9 ref.

Descriptors: *Hydrogeology, *Swamps, *Virginia, *Peat, Marshes, Artesian aquifers, Surface-groundwater relationships, Water balance, Wetlands, North Carolina.
Identifiers: *Dismal Swamp(Va).

The Dismal Swamp, on the border between eastern Virginia and North Carolina is one of the few remaining large (approximately 210,000 acres) areas of wet wilderness in the eastern United States. The hydrologic conditions that led to the formation of the peat in the swamp are described. A permeable sand facies of the Norfolk Formation underlies Dismal Swamp. Movement of water eastward within the Norfolk Formation from the outcrop area on the top of the Suffolk Scarp is restricted by less permeable deposits, thereby creating an artesian head. Erosion during the Pleistocene age breached the confining layer and allowed upward seepage of water along the shallow stream valleys. This seepage, combined with the abundant rainfall and naturally sluggish surface drainage, may have been sufficient to trigger the formation of peat along stream valleys about 9,000 years ago. The peat further inhibited surface drainage, which in turn, accelerated the accumulation of peat until the interfluve areas were covered. Outflow is primarily through the Feeder Ditch-Dismal Swamp Canal system, which discharges at South Mills and Deep Creek locks. Rates and direction of surface flow within the swamp are partly controlled by gates on many of the ditches. Inadequately controlled ditches penetrating the Norfolk Formation plus withdrawal of water from wells along Suffolk Scarp have altered the flow of groundwater under the swamp. These modifications and the loss of water through the Dismal Swamp Canal have probably resulted in a generally drier swamp. (Knapp-USGS)
W75-00238

TRITIUM HYDROLOGY STUDIES IN CALIFORNIA,
California Univ., Los Angeles. Dept. of Chemistry; and California Univ., Los Angeles. Inst. of Geophysics.
For primary bibliographic entry see Field 7B.
W75-00277

GROUNDWATER BASIC DATA OF THE EDMONTON AREA (NORTHWEST SEGMENT), ALBERTA,
Research Council of Alberta, Edmonton.
For primary bibliographic entry see Field 7C.
W75-00318

INVARIANT IMBEDDING AND UNSTEADY GROUND-WATER FLOW,
California Univ., Los Angeles. Dept. of Engineering Systems.
S. Chang, and W. W-G. Yeh.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings Paper 10862, p 1343-1352, October 1974. 2 fig, 2 tab, 10 ref, 2 append. UCAL-WRC-W-290.

Descriptors: *Groundwater, *Water table, *Unsteady flow, *Boundaries(Surfaces), *Mathematical studies, *Hydraulics, Numerical analysis, Linear programming, Computer models, Aquifers, Groundwater movement, Flow, Seepage, Percolation, Mathematical models, Base flow, Reservoirs, Slopes.
Identifiers: Initial value problems, Boundary value problems, Quasilinearization, Imbedding techniques, Surface reservoir, Nonlinear problems.

The invariant imbedding technique was used to find the unknown slope of the water table near the surface reservoir in a problem of unsteady groundwater flow into a surface reservoir in a large unconfined aquifer. The original nonlinear two-point boundary-value problem was transformed into an initial-value problem and an exact solution was obtained by the technique of quasilinearization. The invariant imbedding method involves no trial-and-error procedure and is easily programmed. This technique provides a useful tool in solving field problems and it becomes extremely powerful in solving a family of problems in which a set of unknown initial conditions are required to be determined from the corresponding given set of boundary conditions. (Prickett-ISWS)
W75-00334

SEASONAL VARIATIONS AND DISTRIBUTION OF DISSOLVED IRON IN AN AQUIFER,
Geological Survey of Sweden, Stockholm.
For primary bibliographic entry see Field 5B.
W75-00336

TWO-DIMENSIONAL FINITE ELEMENT MODELING OF TRANSIENT FLOW IN REGIONAL AQUIFER SYSTEMS - ANALYSIS OF GROUNDWATER FLOW IN RELATION TO WATER QUALITY IMPROVEMENT,
Michigan State Univ., East Lansing. Dept. of Civil Engineering.
For primary bibliographic entry see Field 5B.
W75-00426

2G. Water In Soils

DDT RESIDUES IN SOIL, WATER, AND FAUNA FROM NEW YORK APPLE ORCHARDS,
New York State Agricultural Experiment Station, Geneva. Dept. of Entmology.
For primary bibliographic entry see Field 5B.
W75-00109

WASTE WATER RENOVATION THROUGH SOIL PERCOLATION,
Department of Agriculture, Agassiz(British Columbia). Research Station.
For primary bibliographic entry see Field 5D.
W75-00128

PERCOLATION TESTS IN STRATIFIED SOIL,
For primary bibliographic entry see Field 5B.
W75-00132

CHEMICAL WEATHERING, SOIL DEVELOPMENT, AND GEOCHEMICAL FRACTIONATION IN A PART OF THE WHITE MOUNTAINS, MONO AND INYO COUNTIES, CALIFORNIA,
Geological Survey, Washington, D.C.
For primary bibliographic entry see Field 2J.
W75-00230

KAOLINITE SYNTHESIS AT 25 DEG C,
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 2K.
W75-00248

LEACHING OF PICLORAM AND NITRATE IN TWO ALABAMA SOILS,
Auburn Univ., Agricultural Experiment Station.
For primary bibliographic entry see Field 5B.
W75-00263

METABOLIC CAPABILITIES OF SULFUR OXIDIZING BACTERIA AND THEIR ROLE IN WATER POLLUTION,
Kentucky Univ., Lexington. Water Resources Research Inst.
For primary bibliographic entry see Field 5B.
W75-00270

MONITORING TOXIC CHEMICAL POLLUTION FROM LAND DISPOSAL SITES IN HUMID REGIONS,
Illinois State Water Survey, Urbana.
For primary bibliographic entry see Field 5B.
W75-00317

SITE EVALUATION AND DESIGN OF SEEPAGE FIELDS,
Connecticut Univ., Storrs. Dept. of Civil Engineering.
For primary bibliographic entry see Field 5D.
W75-00333

EFFECT OF VARIETY, SPACING AND SOIL FERTILITY ON GROWTH, FLOWERING AND FRUIT DEVELOPMENT IN GROUNDNUT (ARACHIS HYPOGAEA L.) UNDER ARID CONDITIONS,
Uttar Pradesh Inst. of Agricultural Sciences, Kanpur (India).
For primary bibliographic entry see Field 3F.
W75-00352

2H. Lakes

HYDROBIOLOGICAL INVESTIGATIONS OF A BRICK POOL SOUTH OF VIENNA, AUSTRIA (HALLATEICH), (IN GERMAN),
R. Lichtenberg.
Sitzungsber Oesterr Akad Wiss Mathnaturwiss Kl. Vol 180, No 8-10, p 279-316, 1972, Illus.

Descriptors: *Aquatic life, Ponds.

The pool is 4.80 m deep and consists of 2 sections divided by a reed belt. Myriophyllum grows densly on the southern shore with some Potamogeton Crispus and Ceratophyllum demersum; there is no profundal order and no higher plant life at the bottom. There is a mild current, proven by the presence of Centroptilum pennulatum, C. luteolum, Procloeon pseudorufulum, Platycnemis pennipes, Latelmis volckmari and Carinogammarus roeselii in the outflow half, but even here still water forms prevail. The biotopes are classifed as: the plant region, inhabited by Odonata larvae; the shoreline covered with stone; the muddy section, inhabited by Caenis horaria, Libellula quadrimaculata, Orthetrum cancellatum, Sialis flavilatera, Asellus aquaticus, Carinogammarus roeselii and several Diptera; the inflow area and the outflow area which contains predominantly Hydropsyche pellucidula and Simuliidae. Trichoptera, Hemiptera, Hirudinea and Oligochaetes are represented and the effects of mild pollution are evident.--Copyright 1974, Biological Abstracts, Inc.
W75-00009

VEGETATION OF THE SZTUCZNE LAKE IN THE TUCHOLA HEATH AREA, (IN POLISH),
Nicolas Copernicus Univ. of Torun (Poland). Inst. of Biology.
M. Ceynowa-Gieldon, U. Boinska, and M. Boinski.
Zesz Nauk Uniw Mikolaja Kopernika Toruniu Nauki Mat-Przyr Biol. 15, p 19-32, 1972. Illus.

Descriptors: *Vegatation, Lakes.
Identifiers: *Sztuczne Lake(Poland), *Poland.

The Sztuczne lake contains mainly natural plants unchanged by humans. The Cladietummarisci as-

sociation is rare in Poland and forms relatively large and differentiated patches. Next most numerous are Caricetum rostratae Rueble 1912 and Scirpo-Phragmitetum Kock 1926. Less frequent are Heleocharis palustris, Potamogeton natans, P. gramineus and others. A thick, light colored, calcium rich layer of slime was found in the lake and the shore is mostly sandy, but muddy and grassy at some spots.--Copyright 1974, Biological Abstracts, Inc.
W75-00021

HYDROLOGY OF LAKES SYMPOSIUM.
Proceedings of The Helsinki Symposium, Helsinki, July 1973. International Association of Hydrological Sciences Publication No 109, Helsinki, Finland, 1973. 522 p.

Descriptors: *Water balance, *Meteorology, *Hydraulics, *Sedimentation, *Water management(Applied), *Conferences, Hydrology, Lakes, Evaporation, Mathematical models, Stratification.
Identifiers: Helsinki(Finland), Physico-geography.

The hydrology of lakes was discussed at a symposium held at Helsinki in 1973. The six broad topics discussed were physico-geography, water balance, hydro-meteorology, hydraulics, sedimentation and water management. Specific subjects discussed included: (1) The determination of the age of lake water, the turnover time of the storage period, flow channels and stagnant zones by using isotope techniques or other newly-developed methods; (2) Investigations of the long-term fluctuations of lake levels, and the use of results for the prediction of water balance; (3) Comparisons of the actual evaporation of lakes with estimates obtained from different methods including pans, and the effect of aquatic vegetation on evaporation; (4) Investigations of theoretical aspects and numerical as well as analogue models of turbulent diffusion and mixing processes; (5) Investigations of the bedload movement including erosion and the development of the slopes of lake shores; and (6) The use of lakes as reservoirs and operation of outflow. (See also W75-00030 thru W75-00099) (Humphreys-ISWS)
W75-00029

EXPERIENCES OF LAKE CURRENT MEASUREMENTS OBTAINED IN CONNECTION WITH WASTE WATER FLOW STUDIES,
State Inst. for Technical Research, Otaniemi (Finland). Reactor Lab.
For primary bibliographic entry see Field 5B.
W75-00030

ANALYSIS OF FLOW FROM TEMPERATURE DISTRIBUTION IN A LAKE,
Uppsala Univ., (Sweden). Dept. of Physical Geography.
L. Edenman.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p8-12, 1973. 3 fig.

Descriptors: *Water temperature, *Lakes, Hydraulics, Isotherms, Continuity equation, Evaluation, On-site investigations, Velocity, Currents(Water), *Spatial distribution, Temperature, *Flow.
Identifiers: *Sweden(Lake Velen).

A method was described for computing horizontal motion in parts of a lake, for example, narrow bays, from records of the vertical temperature distribution by applying continuity conditions. The method assumed: (1) The water level was constant; (2) The change of heat content was due only to horizontal transport of heat through the cross section; (3) The vertical transport of heat, especially as turbulent diffusion was negligible; (4) The isotherms were horizontal in all directions; (5) The vertical position of the isotherms was determined by the vertical distribution of temperature at station S; and (6) Velocity gradients along the cross section were negligible. Reasonably close agreement was obtained between measured and calculated flow velocities. (See also W75-00029) (Humphreys-ISWS)
W75-00031

A TELEMETERING SYSTEM INCLUDING CURRENT METERS OF THE BUOYANT KITE TYPE,
Helsinki City Engineer's Office (Finland). Water Conservation Lab.
For primary bibliographic entry see Field 7B.
W75-00032

UTILIZATION OF RADAR REGISTRATIONS IN DROGUE MEASUREMENTS,
Uppsala Univ., (Sweden). Dept. of Physical Geography.
For primary bibliographic entry see Field 7B.
W75-00033

TEMPERATURE DISTRIBUTION AND WATER CIRCULATION IN LAKE MJOSA,
Norsk Institutt for Vannforskning, Blindern.
H. Holtan.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 42-48, 1973. 5 fig, 7 ref.

Descriptors: Hydraulics, *Water circulation, *Water temperature, *Lakes, Hydrology, Thermal stratification, Thermocline, Winds.
Identifiers: *Physico-geography, *Norway(Lake Mjosa), Internal static waves(Seiches).

Mjosa is a long, narrow lake of the fjord lake type with a maximum depth of 499 m. Its bottom topography is even and uniform. The circulation periods in Mjosa are very long. In the deep strata there are unstable conditions during the entire winter and spring which last until the summer stratification period is established. In the deep strata the annual temperature variation is from 3.4 to 3.7 C. The wind has a great effect on the temperature distribution and water circulation in the upper water masses in Mjosa. The internal static waves (seiches), caused by the wind, seem to have a cycle of at least 3 days and an amplitude of over 30 m. The wind effects can significantly affect the temperature of the water even at depths of 60 to 70 m. (See also W75-00029) (Humphreys-ISWS)
W75-00034

SOME HYDROLOGICAL PROPERTIES FOR MODELLING THE DYNAMICS OF SMALL ALPINE LAKES,
Uppsala Univ., (Sweden). Dept. of Physical Geography.
B. E. Ryden.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 49-53, 1973. 4 fig, 3 tab, 4 ref.

Descriptors: *Water balance, *Lake morphometry, *Hydrologic properties, Dimensions, Volume, *Lakes, Hydrology, Shape, Flow, Model studies.
Identifiers: *Sweden(Lake Mankijaure), *Sweden(Lake Parekjaure).

Two small lakes within a high mountain basin of Scandinavia were studied in relation to water balance. Variables concerning morphometry and hydrology were presented. Exchange time was estimated. (See also W75-00029) (Humphreys-ISWS)
W75-00035

METHOD FOR DETERMINING THE TURNOVER TIME OF THE WATER RESOURCES OF LAKES WITH AN OUTLET,
Research Inst. for Water Resources Development, Budapest (Hungary).
S. Baranyi.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 54-59, 1973. 3 fig, 3 ref.

Descriptors: *Water balance, Hydraulics, *Turnovers, *Mathematical models, Lakes, Water circulation, Hydrologic equations, Hydrology, Rainfall, Time, Evaporation, Currents(Water), Water resources, Methodology.
Identifiers: *Hungary(Lake Balaton).

A method for determining the turnover time of water resources using Lake Balaton as an example of a lake with an outlet was presented. At first the lake bed was divided into n parts perpendicularly to the longitudinal axis of the lake. Then the water balance equations pertaining to these parts of the lake were written. These equations determined the volume of water flowing from one to another part of the lake. Other terms of the water balance equation were known. In the second step the equation of the 'mixture' consisting of the original resources and inflow and decreased by outflow and evaporation, was written for each part of the lake. In this equation, initial and new volumes of water were distinguished. In the following step the composition of water flowing out from the parts of the lake in time unit t and the composition of water in the lake by the end of the t period were studied. Calculation was performed for each part of the lake month by month until the initial volume of water ran out, enabling the turnover time of water resources in the part of the lake to be obtained. By means of the method presented the turnover times of the individual parts of Lake Balaton were determined and the change of turnover time along the longitudinal axis was obtained. (See also W75-00029) (Humphreys-ISWS)
W75-00036

NATURAL ELECTRIC FIELD IN FRESHWATER LAKES,
Limnologicheskii Institut, Irkutsk (USSR).
V. V. Alexandrov.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 60-65, 1973. 3 fig, 4 ref.

Descriptors: *Water balance, *Lakes, *Electric fields, *Electrical properties, Zeta potential, Hydrology, Freshwater, Currents(Water), Lake morphology.
Identifiers: *USSR(Lake Ladoga).

Some results of measurements of the natural electrical field of lakes were discussed. The natural electric field was analysed as the parameter related to the elements of hydrological regime (currents, waves, filtration) and lake morphological characteristics. Electric parameters, the natural field in particular, may be considered as a way to study the complex structure of the water medium in situ, to discover the laws of formation and existence of other physical fields. Safety and economy of the natural field method are also useful in its utilization in hydrology. (See also W75-00029) (Humphreys-ISWS)
W75-00037

WATER EXCHANGE IN LAKE BAIKAL,
Limnologicheskii Institut, Irkutsk (USSR).
V. I. Verbolov, and M. N. Shimaraev.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 66-71, 1973. 1 fig, 2 tab, 11 ref.

Descriptors: *Water balance, *Water circulation, *Lakes, Hydrology, Movement, Turnovers.
Identifiers: *USSR(Lake Baikal), Horizontal water exchange, Vertical water exchange.

The horizontal exchange within and on the boundaries of separate parts of Lake Baikal and peculiarties of the vertical circulation of its water masses have been analysed using data on the spatial distribution of the elements of the water balance and the indirect indices of water mass movement, such as tritium, transparency and water temperature, and observations of the currents in the whole water mass. (See also W75-00029) (Humphreys-ISWS)
W75-00038

HORIZONTAL CROSS-FLOW TEMPERATURE GRADIENTS IN A LAKE DUE TO CORIOLIS' FORCE,
Norges Tekniske Hoegskole, Trondheim. River and Harbor Lab.
E. Tesaker.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 72-78, 1973. 5 fig, 1 tab, 2 ref.

Descriptors: *Lakes, *Temperature, *Currents(Water), *Coriolis force, *Thermocline, Velocity, Flow, Stratified flow, Density currents, On-site investigations, Theoretical analysis, Iced lakes, Density stratification.
Identifiers: *Physico-geography, *Temperature distribution, *Temperature gradient, *Norway(Lake Sperillen), Lake currents, Velocity distribution.

Temperature measurements in Lake Sperillen have shown that a concentrated flow exists along the right bank through the whole lake. Horizontal density gradients are important for balancing the Coriolis' force. Calculated velocity distributions showed that the flow has the character of an inverse density current. (See also W75-00029) (Jess-ISWS)
W75-00039

PREDICTING THE MONTHLY AVERAGE CHANGES OF WATER STORAGE IN LAKE BALATON--BASED ON THE THEORY OF MARKOV PROCESSES,
Technical Univ. of Budapest (Hungary).
I. V. Nagy, and I. Kontur.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 88-92, 1973. 3 fig, 1 tab, 4 ref.

Descriptors: *Water balance, *Statistical models, *Markov processes, Stochastic processes, Probability, Time series analysis, Hydrologic cycle, Watersheds(Basins), Lakes, Hydrologic budget, Water storage.
Identifiers: *Hungary(Lake Balaton).

Using the theory of time inhomogeneous Markov processes, variations in the water balance of Lake Balaton were analysed. A clear distinction could be made between the periods of accumulation and depletion of water resources; moreover, it was found possible to describe the trend of these changes. Planning work directed at the utilization of the water resources of the lake is more reliably based by the results of these studies. (See also W75-00029) (Humphreys-ISWS)
W75-00040

ANNUAL VARIATION OF SEEPAGE OF LAKES IN THE MORAINE AREA OF THE GERMAN DEMOCRATIC REPUBLIC,
Meteorologischer Dienst der Deutschen Demokratischen Republik, Berlin. Forschungsinstitut fuer Hydrometeorologie.
D. Schumann.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 101-108, 1973. 2 fig, 1 tab, 5 ref.

Descriptors: *Water balance, *Surface-groundwater relationships, *Base flow, *Lakes, Evaporation, Precipitation, Hydrologic cycle, Groundwater recharge, Water level fluctuations, Inflow, *Seepage, Discharge(Water), Hydrologic equation.
Identifiers: *German Democratic Republic(Lake Peetsch-Lake Great Glietzen).

The mean monthly depth of net inseepage and outseepage was determined as the remaining quantity from a hydrologic balance equation which included the rate of rise and fall of water level for two lakes without surface inflow and outflow. This was done for years with normal precipitation and for very dry and very wet years. A distinct annual pattern of groundwater net inflow or outflow was found. On the average, net inflow prevails from March to August, and net outflow in the remaining months. The highest net inseepage occurs in May, the highest net outseepage is observed in November. The relation between net inseepage and outseepage, which is nearly balanced within a normal year, depends on the depth and the seasonal distribution of precipitation. In dry years the lakes are discharge areas; in wet years the lakes contribute to the groundwater recharge. (See also W75-00029) (Sanderson-ISWS)
W75-00041

RELATION EXISTING BETWEEN THE PERIODIC FLUCTUATIONS OF THE WATER LEVELS OF THE HUNGARIAN LAKES AND SOLAR ACTIVITY,
Research Inst. for Water Resources Development, Budapest, (Hungary).
L. Bendefy.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 109-114, 1973. 1 fig, 3 tab, 4 ref.

Descriptors: *Water balance, *Water level fluctuations, *Lakes, Hydrologic budget, High water mark, Low water mark, Water levels, Frequency, Hydrologic cycle.
Identifiers: *Hungary(Lake Balaton-Lake Ferto-Lake of Velence), Solar activity.

The three important lakes in Hungary, Lake Balaton, Lake Ferto, and Lake of Velence, are characterized by extraordinary low water levels and insufficient water supplies. The poorest conditions are encountered on Lake Ferto, the water content and the water supply of which are so small that, in the course of the last 1500 years, the lake desiccated several times. Fish originating from Lake Ferto were, from the fourteenth to nineteenth centuries, strongly in demand on the market in Vienna. Accordingly, there exist a number of explanations for the fact that more or less systematic notes on the level fluctuations of Lake Ferto were prepared. Though these notes were based on observations from water level recorders, they were expressed in an unambiguous and precise manner. In these series of data, periodicities of longer and shorter amplitudes were encountered, superimposed one on the other. Water level fluctuations of Lake Ferto were investigated for a period of roughly 1470 years. Water level fluctuations which were the results of climatic oscillations are exhibiting cycles of 383, 371, 242, 121, 32, 11, and 7 years, respectively. The climatic oscillations accompanied by the largest changes in the water balance of the lake were also exhibited on the Lake of Velence and on Lake Balaton. These variations were in very close correlation to solar activity. (See also W75-00029) (Humphreys-ISWS)
W75-00042

ANALYSIS OF THE TIME SERIES ON VARIATIONS IN NATURAL STORAGE IN LAKE BALATON,
Technical University of Budapest, (Hungary).
I. Kontur.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Sumposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 115-122, 1973. 5 fig, 5 ref.

Descriptors: *Water balance, *Meteorology, *Statistical methods, Water levels, Lakes, Evaporation, Stochastic processes, Heterogeneity, Correlation analysis, *Time series analysis, Hydrologic budget, Hydrologic cycle, Precipitation(Atmospheric), Water storage, Variability.
Identifiers: *Hungary(Lake Balaton).

The inhomogeneity in time of Lake Balaton's water balance was demonstrated. The time series was analysed by different methods in order to explore the fundamental properties of the hydrological system. The final objective was to simulate the hydrological system and to improve the optimal method of water level regulation for Lake Balaton. The described methods of time-series analysis were aimed at promoting the execution of this task. (See also W75-00029) (Humphreys-ISWS)
W75-00043

THE USE OF TRITIUM MEASUREMENT IN THE INVESTIGATION OF LAKE BALATON,
Research Inst. for Water Resources Development, Budapest, (Hungary).
S. Baranyi.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 28-32, 1973. 3 fig, 4 ref.

Descriptors: *Inflow, *Lakes, *Mixing, *Precipitation(Atmospheric), *Tritium, *Tracers, Surface runoff, *Water circulation, *Stagnant water, Water balance, Evaporation, Hydrology, Currents(Water), Radioactive dating.
Identifiers: Lake Balaton(Hungary), Zala(Hungary), Hungary.

Data obtained from tritium measurements taken in Lake Balaton, in major tributaries, in precipitation, and in the lake discharge through the Sio Canal were used to determine a ratio of precipitation to inflow along the length of the lake, to check the results of water balances, to determine the processes of mixing within the lake, and to locate areas of stagnation. Collection of samples varied according to the source. Precipitation was collected continuously with samples taken from a collection at 2-month intervals. Tributaries and the outlet canal were sampled weekly and composited at 2-month intervals. Samples from the lake were taken at 2-month intervals. Water discharged from tributary streams to the lake was not mixed along the length of the lake over a 1-year period; the storage ratios of precipitation and inflow were different in certain parts of the lake; and at the discharge end of the lake there was a higher proportion of old water than at the upstream end. (See also W75-00029) (Harmeson-ISWS)
W75-00044

SOME PROBLEMS OF THE THEORY OF WATER-LEVEL FLUCTUATIONS IN WATER BODIES WITHOUT OUTLETS,
Akademiya Nauk SSSR, Moscow. Institut Vodnykh Problem.
G. P. Kalinin, and R. K. Klige.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 123-129, 1973. 6 fig, 11 ref.

Descriptors: *Water balance, *Meteorology, *Water level fluctuations, Bodies of water, Oceans, Lakes, Hydrologic budget, Water levels, Runoff, Rainfall, Evaporation, Climatology.

The relationship of variations in land water volume and ocean water volume was estimated from data from annual observations. The general trends in changes of the water volume of drainless water bodies and the ocean were analysed. A generalization of the statistical theory of water-level fluctuations in drainless water bodies was given. The relation of water levels in adjacent years was shown to be dependent upon the runoff amount, the shape of the water body, and the ratio of areas of the water body and its basin. (See also W75-00029) (Humphreys-ISWS)
W75-00045

WATER BALANCE VARIABILITY OF LAKES ARAL, BALKHASH, ISSYK-KUL, AND CHANY,
A. V. Shnitnikov.
In: Hydrology of Lakes Symposium; Proceedingsf tThe Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 130-140, 1973. 6 fig, 7 tab.

Descriptors: *Water balance, *Meteorology, *Evaporation, Water levels, Hydrologic budget, Variability, Semiarid climates, Climatology, *Lakes.
Identifiers: *USSR(West Asia), USSR(Lake Aral-Lake Bukhash-Lake Issyk-kul-Lake Chany).

The largest lakes of the semiarid zone of the USSR, Lakes Aral, Balkhash, Issyk-kul, and Chany have no runoff now; their stream-flow regime is balanced within the limits of their hollows. At the same time the water balance of the lakes of this type is subjected to considerable variation within the limits of total humidity intersecular variability of their basins. Some of them, for example Lake Chany, during transgressive phases of intersecular variability even receive inflow, so their water quality becomes considerably better. Independently of intersecular type variability with relatively small amplitude oscillation of water balance components, there is a multisecular variability in the streamflow regime of the lakes. The amplitude of the multisecular variability is two to four times the intersecular variability. The recession phase of multisecular variability is now developing, involving prolonged desiccation of the lakes of the semiarid zone in the future. Therefore, the scientific-technical reconstruction of water balance of the lakes of semiarid zones is needed, as was shown in examples of the largest lakes in West Asia. (See also W75-00029) (Humphreys-ISWS)
W75-00046

PROBLEMS OF WATER BALANCE AND TREND IN THE WATER LEVEL OF LAKE SKADAR,
Institut za Vodoprivredu Jaroslav Cerni, Belgrade (Yugoslavia).
S. Jovanovic, and N. Djordjevic.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 141-148, 1973. 6 fig, 5 ref.

Descriptors: *Water balance, *Meteorology, *Water level fluctuations, *Lakes, Hydrologic budget, Hydrologic cycle, Frequency, Water levels, Time series analysis.
Identifiers: *Yugoslavia(Lake Skadar).

The problem of the long-term fluctuations of Lake Skadar water levels was studied by using moving averages, spectral analysis, and statistical tests. These methods of analysis were applied to hydrological and meteorological series which were very different in respect to quality of data as well as their size. Time series of annual precipitation, inflow, and the stages of the lake were analysed. Due to the lack of long-term observations, the trend of rising lake level could not be adequately explained. (See also W75-00029) (Humphreys-ISWS)
W75-00047

CORRELATIONS AND LONG-TERM PERIODICITY BETWEEN LEVELS OF LAKE COMO AND PRECIPITATION,
S. Cavazza.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 149-157, 1973. 4 fig, 4 tab, 22 ref.

Descriptors: *Water balance, *Meteorology, *Water level fluctuations, Evaporation, *Lakes, Water levels, Hydrologic budget, Hydrologic cycle, Precipitation(Atmospheric), Time series analysis, Variability, Stochastic processes, Frequency.
Identifiers: *Italy, Vercelli-Labrouste method, Weighted moving averages, *Lake Como(Italy), Milan(Italy).

The results of periodic analysis of Lake Como level series, observed at the limnimetric gauge of Malpensata between 1845 and 1964, and of the rainfall records of Milan, were examined. The existing correlations between these two series, the results of which were examined in the light of other existing studies in that field, were also evaluated. These analyses, leading to the evaluation of the main rhythms of the lake region climate, were made by the Vercelli-Labrouste method and were compared to the sinusoidal components of the periodical variations in other lakes and to the relative sunspot value. (See also W75-00029) (Humphreys-ISWS)
W75-00048

WATER BALANCE OF LAKE PEIPSI-PIHKVA,
Tartu State Univ. (USSR).
L-P. Kullus.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 158-163, 1973. 5 tab, 6 ref.

Descriptors: Water balance, *Meteorology, *Evaporation, *Lakes, Water levels, Hydrologic budget, Precipitation(Atmospheric), Runoff.
Identifiers: *USSR(Lake Peipsi-Pihkva), Water balance equation.

The water balance of Lake Peipsi-Pihkva has been calculated for 40 years (1930 to 1969). The average long-term precipitation on the surface of the lake is 633 mm per year, fluctuating between 422 mm (1939) and 842 mm (1966). The mean annual inflow of the rivers is 2630 mm, ranging from 1382 mm (1964) to 4088 mm (1962). The outflow from the lake is about 2537 mm a year, fluctuating between 1462 mm (1940) and 3820 mm (1957). Evaporation equals approximately 570 mm a year, ranging from 429 mm (1958) to 810 mm (1938). The accumulation into Lake Peipsi-Pihkva from 1930 to 1969 was about -18 mm fluctuating between -890 mm (1963) and 930 mm (1962). The fluctuation of the component parts of the water balance in Lake Peipsi-Pihkva was due to varying climatic conditions in the drainage basin of the lake. (See also W75-00029) (Humphreys-ISWS)
W75-00049

THE WATER BALANCE AND THE LEVEL REGIME OF LAKE KHUBSUGUL (KOSOGOL),
Irkutskii Gosudarstvennyi Universitet (USSR).
A. E. Cherkasov, N. Batsukh, and V. P. Shumeyev.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 164-166, 1973. 4 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Lakes, Precipitation(Atmospheric), Runoff, Water levels, Equations, Hydrologic budget.
Identifiers: *USSR(Lake Khubsugul), Water balance equation.

Lake Khubsugul extends north-south, its length is 134 km and its greatest width is 39 km. The area of the lake catchment is 5300 sq km and the area of its water surface is 2730 sq km. As a result of relief distinction, the Khubsugul catchment area is only twice its water surface area. For this reason, the precipitation on its surface and evaporation from its surface are of great inportance in its water balance. The elements of the water balance were defined and the water level regime of Lake Khubsugul was discussed. (See also W75-00029) (Humphreys-ISWS)
W75-00050

WATER BALANCE OF LAKES IN DIFFERENT PHASES OF HUMIDIFICATION CYCLES,
V. P. Nehaichik.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 167-169, 1973. 2 tab, 2 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, Solar distillation, Hydrologic cycle, Hydrologic budget, *Lakes, Water levels, Precipitation(Atmospheric).
Identifiers: USSR.

The water balance of lakes was described in relation to long-term periods of high and low humidification of areas where lakes and their drainage basins are located. The data showed that the water recharge during the periods of high humidification was 50% higher than during the periods of low humidification. During the periods of high humidification the recharge of lakes in areas where evaporation plays an important role was larger than the discharge; whereas in the periods of low humidification the discharge was greater than the recharge. Thus in the periods of low humidification a reduction of the water volume in lakes was observed and during periods of high humidification the water volume increased. In arid areas, a great number of lakes dry up in periods of low humidification and reappear during periods of high humidification. (See also W75-00029) (Humphreys-ISWS)
W75-00051

THE WATER BALANCE OF LAKE BAIKAL,
Limnologicheskii Institut, Irkutsk (USSR).
A. N. Afansyev, and V. D. Leksakova.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 170-175, 1973. 1 fig, 3 tab, 4 ref.

Descriptors: *Water balance, *Meteorology, *Lakes, Hydrology, Runoff, Evaporation, Equations, Precipitation(Atmospheric), Air circulation, Rivers, Water levels, Hydrologic budget.
Identifiers: *USSR(Lake Baikal), Water balance equation.

Methods for calculating the elements of the water balance were discussed. Data were given on the water balance during natural and corrected regimes in Baikal. Ways of compiling prognoses of the water level in the lake, annually and up to the year 2000, were discussed on the basis of the study of the fluctuations and changes in the water balance. (See also W75-00029) (Humphreys-ISWS)

W75-00052

THE LONG-TERM PATTERN IN THE LEVEL FLUCTUATION OF THE URAL LAKES AND ITS RELATIONSHIP WITH ATMOSPHERIC CIRCULATION,
Chelyabinskii Gosudarstvennyi Pedagogicheskii Institut (USSR).
M. A. Andreeva.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 176-181, 1973. 4 fig, 2 tab, 3 ref.

Descriptors: *Water balance, *Meteorology, *Water level fluctuations, Lakes, Hydrologic budget, Variability, Statistics, Correlation analysis, Air circulation, Climatic data, Humidity, Forecasting, Weather patterns.
Identifiers: *USSR(Urals-Transurals).

Investigations revealed the cyclic character of long-term fluctuations of humidity and level in the Ural lakes. The duration of cycles of the fluctuation in the area to the west of the Urals is 18 to 22 years, and 22 to 24 years in the Transurals. Long-period tendencies in the variability of humidity and the level regime of lakes may be explained by the variations of atmospheric circulation. The phases of water fall and rise correspond to repeated patterns of different forms of circulation. The period of greater activity of meridional and western forms of circulation processes cause positive anomalies, while eastern forms of circulation cause negative anomalies. The degree of influence of the main forms of circulation on humidity regime in various regions of the Urals is not identical. The meridional circulation reduces the rate of increase of humidity from the south to the north, both in the area to the west of the Urals and in the Transurals. Meridional circulation causes the most humidity in the southeastern Transurals, and the lowest in the area of the Cama River. Conversely, the influence of western circulation diminishes from the north to the south as well as from the west to the east. The greater period of activity in the eastern circulation processes is accompanied by decrease of humidity on the whole territory. The obtained dependences of humidity and water regime in lakes upon macrocirculating processes can be used to forecast the water regime in lakes. (See also W75-00029) (Humphreys-ISWS)
W75-00053

A STUDY OF WATER LEVEL VARIATIONS IN ENCLOSED RESERVOIRS BY MEANS OF STOCHASTIC MODELS OF THE WATER BALANCE CONSTITUENTS,
For primary bibliographic entry see Field 2E.
W75-00054

INFLOW TO LAKES OF THE SEMIARID ZONE OF THE USSR FROM GROUNDWATER,
For primary bibliographic entry see Field 2F.
W75-00055

WATER BALANCE OF THE LAKES AND RESERVOIRS OF THE CAUCASUS MINOR (WITHIN THE AZERBAIJAN SSR),
Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Institut Geografii.
Kh. D. Zamanov.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 191-196, 1973. 1 fig, 1 tab, 8 ref.

Descriptors: *Water balance, *Meteorology, *Lakes, Hydrology, Runoff, Evaporation, Precipitation(Atmospheric), Rainfall, Snowmelt, Rivers, Water levels, Hydrologic budget, Reservoirs.
Identifiers: *USSR(Caucasus Minor), Water balance equation.

The total number of reservoirs of the Caucasus Minor (with storage lakes and seasonal lakes) is 250. Ninety percent of them lie over 2500 m above sea level. In spite of their small dimensions and volumes they are widely used for irrigation, stock watering, water supply to the populated areas, regulation of drainage, etc. Routine hydrometeorological observations are conducted only in Lakes Geygel Kurakchay and Geygel Shamhorachy which are in the alpine areas of the Caucasus Minor. During research into the water balance and hydrometeorological condition of the reservoirs, observations were made on site 1962-1964 and 1966-1968 and these data were used along with routine data and literary sources already available. Different feeding of the reservoirs was reflected in the fluctuation of their levels. The maximum levels of the alpine reservoirs occurred in May-July, i.e., in the period of intensive snow thawing. In the lower reservoirs the maximum level was observed in March-April. The levels of the lakes ranged from 0.5 to 4.0 m, and of the reservoirs from 2 to 10 m annually. Thirty-seven to seventy percent (sometimes more than 80%) of the precipitation becomes flow, the rest evaporates. From alpine reservoirs 1-8% of the annual balance expenditure is lost by evaporation, while in the foothills and low-lying lakes the loss is 8-16%. Subterranean flow in the small reservoirs comprises 7-10% of the spring waters of the lakeside. About 60-95% of the balance of the separate reservoirs, lying in the Volcanic uplands, is subterranean flow. (See also W75-00029) (Humphreys-ISWS)
W75-00056

STUDYING THE ROLE OF GROUNDWATER FLOW IN WATER AND SALT BALANCES OF LAKES,
Akademiya Nauk SSSR, Moscow. Institut Vodnykh Problem.
For primary bibliographic entry see Field 2F.
W75-00057

EVAPORATION FROM THE LAKES IN FINLAND,
Finnish Meteorological Office, Helsinki.
For primary bibliographic entry see Field 2D.
W75-00058

COMPARISON OF CALCULATION METHODS FOR EVAPORATION USING LAKE BALATON AS AN EXAMPLE,
National Meteorological Service, Budapest (Hungary).
For primary bibliographic entry see Field 2D.
W75-00059

A COMPARISON OF SEVERAL METHODS OF ESTIMATING THE EVAPORATION OF LAKE FLEVO,
Royal Netherlands Meteorological Inst., De Bilt.
For primary bibliographic entry see Field 2D.
W75-00060

A COMPARISON OF VARIOUS METHODS USED FOR THE DETERMINATION OF EVAPORATION FROM FREE WATER SURFACES,
Meteorologischer Dienst der Deutschen Demokratischen Republik, Berlin. Forschungsinstitut fuer Hydrometeorologie.
For primary bibliographic entry see Field 2D.
W75-00061

EVAPORATION FROM LAKE VELEN ESTIMATED FROM THE ENERGY BUDGET,
Uppsala Univ. (Sweden). Dept. of Physical Geography.
For primary bibliographic entry see Field 2D.
W75-00062

THE LAKE VELEN PROJECT AND SOME OF ITS RESULTS,
International Hydrological Decade, Stockholm (Sweden). Swedish National Committee.
M. Falkenmark.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 245-262, 1973. 6 fig, 2 tab, 13 ref.

Descriptors: *Meteorology, *Evaporation, *Water balance, Hydrologic budget, Water temperature, Seasonal, Summer, Winter, Temperature stratification, *Lakes.
Identifiers: *Sweden(Lake Velen), Isopleths.

A short review was given of a research project aimed at a better understanding of the nature of water movements in lakes with different forms. The first object under study was the small Lake Velen with an elongated form, divided in two basins. Water movements were studied with both direct and indirect methods. Some results from the temperature studies were reported. The water exchange between the main basin and a bay was illustrated. The calculated lake evaporation for four consecutive summers was tabulated. (See also W75-00029) (Humphreys-ISWS)
W75-00063

EVALUATION OF THE PENMAN METHOD FOR THE COMPUTATION OF EVAPORATION FROM WATER BODIES USING OBSERVED DATA,
Gosudarstvennyi Gidrologicheskii Institut, Leningrad (USSR).
For primary bibliographic entry see Field 2D.
W75-00064

DETERMINATION OF EVAPORATION FROM LAKE AND RESERVOIR SURFACES USING THE HEAT BALANCE METHOD,
Main Geophysical Observatory, Leningrad (USSR).
For primary bibliographic entry see Field 2D.
W75-00065

WATER BALANCE OF LAKES PYHAJARVI AND PAAJARVI,
National Water Board of Finland, Helsinki.
V. Hyvarinen, J. Jarvinen, and T. Tuominen.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 276-283, 1973. 5 fig, 3 tab, 5 ref.

Descriptors: *Water balance, *Meteorology, *Evaporation, *Lakes, Runoff, Equations, Precipitation(Atmospheric), Water levels, Hydrologic budget, Evaporimeters.
Identifiers: *Finland(Lake Pyhajarvi), *Finland(Lake Paajarvi), Water balance equations.

Intensified observations for determining the evaporation from Lake Paajarvi began in 1969. In 1971 observations in Lake Pyhajarvi were started. Inflow, outflow, water level of the lake and precipitation on the lake surface were measured for calculating the lake evaporation by the water balance method. Water vapor pressure at the water surface and in the air above the surface as well as wind velocity were measured for determining the evaporation aerodynamically. Direct lake evaporation measurements by floating evaporimeters were also carried out. The purpose was to establish the relationship between the meteorological parameters and lake evaporation in different parts of Finland. The results presented were preliminary, owing to the short observation period. Yet they agreed quite well with the national water balance maps recently drawn in Finland on the basis of corrected precipitation data

and measured discharge. Both showed that yearly lake evaporation may exceed 500 mm in southern Finland. (See also W75-00029) (Humphreys-ISWS)
W75-00066

EVAPORATION FROM SMALL WATER RESERVOIRS,
Polish Academy of Sciences, Golysz. Fish Culture Station.
For primary bibliographic entry see Field 2D.
W75-00067

EXPERIENCES WITH EVAPORATION PANS AT A SHALLOW STEPPE-LAKE IN AUSTRIA,
Zentralanstalt fuer Meteorologie und Geodynamik, Vienna (Austria).
For primary bibliographic entry see Field 2D.
W75-00068

RATES OF VERTICAL ENTRAINMENT IN STRATIFIED LAKES,
Canada Centre for Inland Waters, Burlington (Ontario).
J. O. Blanton.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 301-305, 1973. 4 fig, 1 tab, 10 ref.

Descriptors: Hydraulics, *Lake morphometry, *Entrainment, *Stratification, Stability, *Lakes, Epilimnion, Thermocline.
Identifiers: North temperate zone, Vertical diffusion coefficient.

The rate of vertical entrainment in a stratified lake was specified in terms of the rate of growth in volume of the epilimnion. Rates for lakes with widely varying morphometry were calculated and correlate well with the static stability across the thermocline. The mean depth of a lake appeared to be the single most important morphometric parameter. The rate of entrainment can also be interpreted in terms of vertical diffusion in the epilimnion. (See also W75-00029) (Adams-ISWS)
W75-00069

CONCLUSIONS ABOUT TURBULENT EXCHANGE COEFFICIENTS FROM MODEL STUDIES,
Lund Inst. of Tech. (Sweden).
L. Bengtsson.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 306-312, 1973. 3 fig, 5 tab, 13 ref.

Descriptors: *Hydraulics, *Mathematical models, *Diffusivity, *Stratification, *Circulation, Model studies, *Lakes, Turbulence, Dispersion, Winds, Eddies, Velocity, Viscosity.
Identifiers: *Sweden, Drogues, Dye studies, Random walk model.

Field values of diffusivity and vertical eddy viscosity were obtained from dye studies and drogue measurements. Various mathematical models were used to analyze the data. The horizontal diffusivity for four lakes in Sweden was about 200 sq cm/sec. The vertical diffusivity depends on the wind velocity and was found to be on the order of 10 sq cm/sec. The circulation pattern and velocity depends on the wind stress and the vertical eddy viscosity. The horizontal eddy viscosity does not have a major effect on the circulation. (See also W75-00029) (Adams-ISWS)
W75-00070

MATHEMATICAL MODELS OF WIND INDUCED CIRCULATION IN A LAKE,
Lund Inst. of Tech. (Sweden).
L. Bengtsson.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 313-320, 1973. 6 fig, 2 tab, 14 ref.

Descriptors: Hydraulics, *Mathematical models, *Water circulation, *Lakes, *Winds, Thermocline, Turbulence, Coriolis force, Friction, Diffusion, Density currents, Shallow water, Dispersion, Hypolimnion, Epilimnion, Homogeneity.
Identifiers: Two-layered water masses, *Sweden(Lake Velen), *Wind stress, Coastal currents, Baroclinic stationary models, Transient models, Transport mechanisms, Barotropic stationary models.

Transient and steady-state models depicting wind induced circulation in lakes for homogeneous and two layered water masses were developed and reported. The theoretical stationary model results were compared with field data on circulation patterns collected from Lake Velen. Correspondence between the theory and the field data was good. When the thermocline reaches the lake bottom, the possibility of momentum transfer was investigated. Knowledge of the mechanism of turbulence generation and propagation in lakes was thought more important than the analytical model developed. Depth of thermocline and turbulence determined the time required to attain the steady state in the lake. It was concluded that it takes only a few hours before the steady state circulation patterns are established in lakes. (See also W75-00029) (Bhowmik-ISWS)
W75-00071

STABILITY OF THERMAL STRATIFICATION IN A LAKE,
Meteorologischer Dienst der Deutschen Demokratischen Republik, Berlin. Forschungsinstitut fuer Hydrometeorologie.
M-L. Heitmann.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 321-326, 1973. 2 fig, 2 tab, 5 ref.

Descriptors: Hydraulics, *Stability, *Lake morphology, *Stratification, Density stratification, Thermocline, Lakes, Temperature.
Identifiers: *Temperature gradients, Field measurements, *Germany(Lake Stechlin).

Detailed temperature measurements collected over an 8 year period were analyzed to determine the microstructure of the thermocline and the vertical exchange of Lake Stechlin, Germany. The lake is 68 m deep and has a surface area of 4.25 sq km. The vertical stability, which is proportional to the density gradient, was found to provide an improved indication of vertical stratification as compared with the magnitude of the temperature gradient. (See also W75-00029) (Adams-ISWS)
W75-00072

HORIZONTAL DIFFUSION IN LAKE CURRENTS,
Canada Centre for Inland Waters, Burlington (Ontario).
C. R. Murthy.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 327-334, 1973. 3 fig, 1 tab, 2 ref.

Descriptors: Hydraulics, *Currents(Water), *Diffusion, *Lake Ontario, *Lakes, On-site investigations, Tracers, Diffusivity, Rhodamine, Dye dispersion, Dispersion, Variability, Statistical methods, Correlation analysis, Regression analysis.
Identifiers: Richardson's law of diffusion, Eddy diffusivity.

Experimental data on the diffusion of fluoroscent dye patches were obtained in Lake Ontario to study large-scale horizontal diffusion in the epilimnion. In each experiment, a slug of water-soluble rhodamine dye solution was introduced at mid-depth in the epilimnion. The growth of the diffusing dye patch was followed from 3 to 60 h after dye release, using fluorometric sampling. The data covered a length scale (i.e., Patch Size) of 100 m to 15 km and the corresponding eddy diffusivities varied from 100 to 1,000,000 sq cm/sec. Longitudinal eddy diffusivities were greater by a factor of 2 to 10 as compared to transverse eddy diffusivities. The results were discussed in terms of the similarity theory of turbulence. (See also W75-00029) (Humphreys-ISWS)
W75-00073

TURBULENCE CHARACTERISTICS OF HORIZONTAL CURRENTS IN A SMALL LAKE AND THEIR APPLICATIONS,
Uppsala Univ. (Sweden). Dept. of Physical Geography.
E. Eriksson, and K. Sundberg.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 335-345, 1973. 12 fig, 3 tab, 1 ref.

Descriptors: *Lakes, Hydraulics, *Turbulence, *On-site investigations, Currents(Water), Diffusion, Simulation analysis, Statistics, Water temperature, Water circulation, Velocity.
Identifiers: *Sweden(Lake Velen), *Horizontal lake currents, Drogues, Lagrangian motion.

Lake temperature distribution caused by horizontal currents was studied. The currents were measured by means of drogues (a sea anchor or type of drag chute) placed at various depths. Assuming Lagrangian motion, various turbulence statistics were computed from the data, and a simple model to forecast turbulent diffusion characteristics was developed. Results showed separation of points by turbulent diffusion with time. (See also W75-00029) (Jess-ISWS)
W75-00074

THE TURBULENT REGIME OF A SHALLOW RESERVOIR,
Main Geophysical Observatory, Leningrad (USSR).
B. G. Vager, and V. V. Simonov.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 346-350, 1973. 6 fig.

Descriptors: Hydraulics, *Mathematical studies, *Turbulent flow, Equations, Heat transfer, Waves(Water), Winds, Mixing, *Reservoirs, Lakes, Thermocline, Theoretical analysis.
Identifiers: Shallow reservoirs.

The structure of a shallow, watertight, horizontally homogeneous reservoir with the presence of shearing stress on its free surface was considered. Coriolis' force, turbulent heat exchange with the atmosphere, and radiated heat flux were taken into account. The initial nonlinear system of equations was supplemented by the interpolating formula for the turbulent scale connecting it with the internal characteristics of the flux with consideration of two linking boundary layers in this flux. The influence of different external factors upon the thermodynamic structure of the shallow reservoir was investigated on the basis of numerical solution. An attempt was made to estimate some values connected with the transmission of energy from air to water. (See also W75-00029) (Humphreys-ISWS)
W75-00075

THE SEICHES ON LAKES LADOGA AND ONEGA,
Limnologicheskii Institut, Irkutsk (USSR).
T. I. Malinina.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 351-356, 1973. 2 fig, 1 tab, 6 ref.

Descriptors: Hydraulics, *Water level fluctuations, *Seiches, *Lakes, Water levels, Surface waters, Surges, Waves(Water), Winds, Currents(Water), Frequency.
Identifiers: *USSR(Lake Ladoga-Lake Onega).

Study of the characteristics of the seiches on Lake Ladoga and Lake Onega was based on a large number of data obtained with 12 water-level recorders placed on Lake Ladoga and 16 water-level recorders placed on Lake Onega. Calculations of periods of longitudinal and transverse seiches were made using theoretical methods. The calculated data were compared with those observed. The seiche periods on the lake varied from several minutes to 4-5 h. The seich amplitude was rather small, ranging from 2-3 cm to 20 cm. A characteristic of the seiches was defined for different bays on the lakes. Data were given on the seich currents observed on the lakes. (See also W75-00029) (Humphreys-ISWS)
W75-00076

THE EFFECT OF LONG WAVES ON FLOW CURRENTS IN CHANNEL-TYPE RESERVOIRS,
Gosudarstvennyi Gidrologicheskii Institut, Lengingrad (USSR).
T. N. Filatova, and G. P. Artugin.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 357-362, 1973. 3 fig, 1 tab, 7 ref.

Descriptors: Hydraulics, *Water level fluctuations, *Waves(Water), *Reservoirs, Lakes, Water levels, Currents(Water), Frequency, Wavelengths, Hydroelectric plants, Regulation.
Identifiers: *Channel-type reservoirs, *USSR(Ivankovo and Uglich Reservoirs).

Based on laws of long wave development, the effect of long waves on flow currents of channel-type reservoirs under different controls was analysed. The report was based on the data of observations (during 1-8 days) on given verticals of Ivankovo and Uglich Reservoirs, where currents and wind were observed during the navigation period 1967 to 1969. Data on the operation procedure of hydroelectric power plants and water levels were also used. The data presented may be used to explain the effect of long waves on flow currents of lakes and reservoirs that are regulated. (See also W75-00029) (Humphreys-ISWS)
W75-00077

TURBULENT DIFFUSION AND TURBULENT EXCHANGE SIMULATION IN LAKES AND RESERVOIRS WITH OUTFLOW,
Gosudarstvennyi Gidrologicheskii Institut, Leningrad (USSR).
V. A. Znamenski.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 363-368, 1973. 3 ref.

Descriptors: Hydraulics, *Lakes, *Reservoirs, *Turbulence, *Currents(Water), Simulation analysis, Reservoir releases, Diffusion, Equations, Discharge(Water), Hydraulic models, Mathematical studies.
Identifiers: *Turbulent diffusion, *Turbulent exchange, Froude number, Reynolds number, Euler number.

Problems in the evaluation of turbulent diffusion in lakes and reservoirs with outflow were discussed. To simplify the problems it was assumed that the water mass is vertically homogeneous and diffusion is connected with the flow of the transit current. Thus, the problem was reduced to classical hydraulics and solution became possible by hydraulic model simulation. (See also W75-00029) (Jess-ISWS)
W75-00078

THERMAL REGIME OF LAKE ONEGA AND THE PROCESSES OF LATERAL AND VERTICAL WATER EXCHANGE,
Limnologicheskii Institut, Irkutsk (USSR).
A. J. Tikhomirov.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 369-373, 1973. 2 fig, 1 tab, 6 ref.

Descriptors: Hydraulics, *Water temperature, *Heat balance, Thermal stratification, *Lakes, Seasonal, Water circulation, Mixing, Destratification, Equations.
Identifiers: *USSR(Lake Onega), *Thermal regime, Heat balance equation.

The water mass of a freshwater lake is usually composed of a series of layers with various densities due to differences in water temperature. Variations in temperature and water density with time characterize the features of thermal regime formation of Lake Onega. The calculated heat balances of this body of water and its separate regions were used to estimate their water exchange. The coefficients reflecting the dependence between the water temperature of separate layers were given. There is the stability course, which is the amount of work necessary for total mixing of the whole mass of water and complete equalization of temperature from spring until autumn homothermium. Maximum stability in the lake occurred before the heat content of the water mass reached its maximum. (See also W75-00029) (Humphreys-ISWS)
W75-00079

WATER MIXING IN DIFFERENT TYPES OF STORAGE RESERVOIRS,
Gdansk Technical Univ. (Poland).
J. Cyberski, and B. Cyberska.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 374-379, 1973. 5 fig, 1 tab, 8 ref.

Descriptors: Hydraulics, *Mixing, *Reservoirs, *Density currents, Inflow, Stratification, Stability, Temperature, Sediment load, Lakes, Discharge(Water).
Identifiers: *Wind currents, *Poland.

Thirteen reservoirs in Poland were classified according to exchange characteristics. Reservoirs that have a slow exchange of water (less than 3 or 4 changes per year) were called limnical. Those that have more rapid exchange of water were called reolimnical. The roles of meteorological and hydrological processes in reservoirs of both types were studied. Meteorological factors were more important in the exchange processes in limnical reservoirs. Hydrological factors were more important in reolimnical reservoirs. As the exchange process becomes more rapid, wind caused currents decrease in important but density currents increase in importance. (See also W75-00029) (Adams-ISWS)
W75-00080

THE SIGNIFICANCE OF SEDIMENT DEPOSITS IN LARGE LAKES AND THEIR ENERGY RELATIONSHIPS,
Canada Centre for Inland Waters, Burlington (Ontario).
For primary bibliographic entry see Field 2J.
W75-00081

SEDIMENTATION AND TRANSPORT OF PARTICLES IN LAKE KINNERET TRACED BY CS-137,
Weizmann Inst. of Science, Rehovoth (Israel). Isotope Dept.
For primary bibliographic entry see Field 2J.
W75-00082

MODEL TEST ON LAKE VELENCE FOR STUDYING FLOWS AND SEDIMENT CAUSED BY WIND,
Research Inst. for Water Resources Development, Budapest (Hungary).
For primary bibliographic entry see Field 2J.
W75-00083

HYDRAULIC MODEL STUDY OF SEDIMENT MOVEMENT AND CHANGES IN THE BED CONFIGURATION OF A SHALLOW LAKE,
Research Inst. of Water Resources Development, Budapest (Hungary).
For primary bibliographic entry see Field 2J.
W75-00084

THE SHORE DYNAMICS OF A MOUNTAIN PLAIN RESERVOIR OF THE AZERBAIJAN SSR,
Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Institut Geografii.
For primary bibliographic entry see Field 2J.
W75-00085

THE ROLE OF HYDROLOGICAL AND GEOLOGICAL PROCESSES IN THE FORMATION OF SHORES AND BEDS OF LARGE STORAGE RESERVOIRS,
Perm State Univ. (USSR).
For primary bibliographic entry see Field 2J.
W75-00086

SEDIMENT BALANCE OF THE VOLGA RESERVOIRS,
Akademiya Nauk SSSR, Moscow. Institut Biologii Vnutrennykh Vod.
For primary bibliographic entry see Field 2J.
W75-00087

OPTIMUM WATER LEVEL REGULATION OF LAKE BALATON, HUNGARY,
Water Resources Center, Budapest (Hungary).
For primary bibliographic entry see Field 4A.
W75-00088

AN OPTIMIZATION MODEL FOR THE OPERATION OF LAKE KINNERET,
Tahal Consulting Engineers Ltd., Tel-Aviv (Israel).
For primary bibliographic entry see Field 4A.
W75-00089

WATER MANAGEMENT ON LAKE VELENCE WITH SPECIAL REFERENCE TO OPTIMUM WATER LEVEL,
Water Resources Center, Budapest (Hungary).
For primary bibliographic entry see Field 6A.
W75-00090

PLANNING A WATER RESOURCES SYSTEM WITH MULTI-PURPOSE RESERVOIRS BY

BREAKING DOWN THE SYSTEM ACCORDING TO ITS VARIOUS FUNCTIONS,
Institut za Vodoprivredu Jaroslav Cerni, Belgrade (Yugoslavia).
For primary bibliographic entry see Field 6A.
W75-00091

DISTRIBUTION OF OUTFLOW FROM A LAKE WITH SERIALLY CORRELATED INFLOW,
Department of the Environment, Ottawa (Ontario). Inland Waters Directorate.
For primary bibliographic entry see Field 4A.
W75-00092

THE CONSTRUCTION AND MANAGEMENT OF SANDPIT LAKES IN THE WESTERN AREA OF THE NETHERLANDS,
South Holland Provincial Waterboard, The Hague (Netherlands).
For primary bibliographic entry see Field 5B.
W75-00093

LONG-TERM WATER STAGE REGIME IN NATURAL LAKES OF KARELIA AND ITS CHANGES IN VIEW OF CONVERSION OF LAKES INTO STORAGE RESERVOIRS,
Akademiya Nauk SSSR, Petrozavodsk. Karelskii Filial.
K. D. Litinskaya.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 486-491, 1973. 2 fig, 6 ref.

Descriptors: *Water levels, *Lakes, *Water management(Applied), *Reservoirs, *Water level fluctuations, Geomorphology, Hydrology, Watersheds(Basins), Amplitude, Lake morphology.
Identifiers: *USSR(Lakes of Karelia), Baltic Sea, White Sea.

Observations of water-level fluctuations were carried out systematically in 68 lakes (with the exception of Lakes Onega and Ladoga) out of 61,000 lakes in Karelia. Observations cover from 11 to 30 years. Synchronous measurements of water level were made in 22 lakes between 1950 and 1963. The mean annual amplitude of water-level fluctuations increases with the rise in specific watersheds. According to these values the lakes in Karelia are divided into three types. Each type falls into two sub-types differing in annual variation of levels and dependent on the morphology of each lake basin and on the hydrographic structure of its watershed. Annual fluctuations in the levels of reservoirs situated in the Baltic Sea drainage area are more stable and synchronous than those of the lakes in the White Sea watershed. The highest water levels in the lakes of Karelia were observed in the same year (1962) while the lowest water levels were observed during different years. The lakes are remarkable for the stability of their winter levels, while the greatest drop in winter levels is characteristic of the wettest years. Almost all the big lakes in Karelia are storage reservoirs and form 38% of the water surface of the territory. The water stage regime in reservoirs is less stable than that in lakes because of the lowering of the levels of available water to meet the demand: annual water-level amplitudes are seven to eight times higher and water phases are not pronounced. (See also W75-00029) (Dawes-ISWS)
W75-00094

CHARACTERISTICS OF THE REGIME AND STRUCTURE OF WATER MASSES IN THE VOLGA RESERVOIRS,
Akademiya Nauk SSSR, Moscow. Institut Vnutrennykh Vod.
N. V. Butorin.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 492-495, 1973. 2 tab, 1 ref.

Descriptors: *Water balance, *Water levels, *Water management(Applied), Reservoirs, Lakes, Hydrology, Water temperature, Water quality.
Identifiers: *USSR(Rybinsk Reservoir).

The characteristics of the hydrological regime of reservoirs are shown in peculiarities of the water balance, water circulation, level, wave, temperature, and ice regimes. The peculiarities of the hydrological regime lead to heterogeneity in the physical and chemical characteristics of the water. Detailed analysis of these characteristics made it possible to identify distinct water masses with different properties in reservoirs. Volumes of identified water masses were tabulated in percentage of reservoir volumes. (See also W75-00029) (Humphreys-ISWS)
W75-00095

RISK EVALUATION OF TIDAL-INFLUENCED FLOOD CONTROL RESERVOIR,
Technical Univ. of Denmark, Lyngby. Inst. of Hydrodynamics and Hydraulic Engineering.
For primary bibliographic entry see Field 4A.
W75-00096

INFLUENCE OF STORAGE RESERVOIRS ON THE THERMAL REGIME OF RIVERS,
Panstwowy Instytut Hydrologiczno-Meteorologiczny, Gdynia (Poland).
For primary bibliographic entry see Field 4A.
W75-00097

CONTROL OF WATER BALANCE OF DRAINLESS LAKES IN THE FUTURE,
Akademiya Nauk SSSR, Moscow. Institut Geografii.
For primary bibliographic entry see Field 4A.
W75-00098

AN INTERACTIVE ALGORITHM FOR THE MULTI-PURPOSE CONTROL OF A NATURAL LAKE,
Arizona Univ., Tuscon. Dept. of Systems and Industrial Engineering. Arizona Univ., Tuscon. Dept. of Hydrology and Water Resources.
For primary bibliographic entry see Field 4A.
W75-00099

DYNAMICS OF THE VEGETATION IN THE EUTROPHIC MARSHES OF THE GIURGEU DEPRESSION, (IN RUMANIAN),
Babes-Bolyai Univ., Cluj (Rumania).
For primary bibliographic entry see Field 5C.
W75-00135

OBSERVATIONS ON WATER MOVEMENT, CHEMICAL LAYERING AND FISH MIGRATIONS IN VARZEA-LAKES AT THE MIDDLE SOLIMOES (RIVER AMAZON), (IN GERMAN),
Instituto Nacional de Pesquisas da Amazonia, Manaus (Brazil).
For primary bibliographic entry see Field 5C.
W75-00136

GREAT LAKES RESEARCH ADVISORY BOARD THIRD SEMI-ANNUAL REPORT, APRIL 1974.
Great Lakes Research Advisory Board, Report to International Joint Commission, April 1974. 81 p.

Descriptors: *Great Lakes, *International Joint Commission, *Water quality, Water management(Applied), Waste water treatment, Sampling, Europhication, Limnology, Simulation analysis, Model studies, Viruses.
Identifiers: Great Lakes Research Advisory Board.

The third semiannual report of the Great Lakes Research Advisory Board to the International Joint Commission covers the activities of the Board since the submittal of its October 1973 report. The Research Advisory Board as established under provisions of the Canada-United States Agreement on Great Lakes Water Quality functions to review research activities concerned with and applicable to the quality of the waters of the Great Lakes System; make recommendations to the IJC concerning research needs, and provide scientific advice on specific problems. The 7 committees studied: scientific basis for water quality criteria; social sciences, economic and legal aspects; health aspects; water and wastewater treatment; analytical sampling and measurement; methods; lake dynamics; and eutrophication. The semiannual report also contains the report of Ad Hoc Committee on needs for a Great Lakes Simulation Modelling Symposium; the summary position paper on asbestos-like fibers; the summary report on the Symposium: viruses in the environment and their potential hazards; the summary of findings of the Ad Hoc Committee on virology research needs; and the 1973 Great Lakes Research Advisory Board membership list. (Knapp-USGS)
W75-00229

INVENTORY OF RESEARCH ACTIVITIES IN THE LAKE TAHOE AREA, 1878-1974,
Lake Tahoe Area Research Coordination Board, South Lake Tahoe, Calif.
J. R. Jones, and J. D. Stuart.
July, 1974. 128 p. NSF GT-39556.

Descriptors: *Bibliographies, Information retrieval, *Research and development, *California, *Nevada, Publications.
Identifiers: *Lake Tahoe, Tahoe basin.

A bibliography of 492 research publications and items which might be useful to researchers for the Lake Tahoe Area, California and Nevada, has been compiled. A master file listing was made which has been subdivided into the following categories; Air, Land, Water, Vegetation, Animal Life, Socio-Economic, and Resource Allocation. The water section of the bibliography contains 111 references under sub-groupings of limnology, water supply, water quality, water resources managements and waste water treatment. The bibliographical notations are arranged chronologically. The appendices include an Author Index, A Chronological Index, a Subject Index and a listing of Current Research activities. The Inventory master listing will be kept current and published periodically.
W75-00280

DIVERSION OF LAKE MICHIGAN WATERS,
Michigan Attorney General's Office, East Lansing.
For primary bibliographic entry see Field 6E.
W75-00303

ORDINATION OF SOME LITTORAL BENTHIC COMMUNITIES IN BEAR LAKE, UTAH-IDAHO,
California Univ., Berkeley. School of Forestry and Conservation.
For primary bibliographic entry see Field 5C.
W75-00322

INVARIANT IMBEDDING AND UNSTEADY GROUND-WATER FLOW,
California Univ., Los Angeles. Dept. of Engineering Systems.
For primary bibliographic entry see Field 2F.
W75-00334

EFFECT OF CUTTING DOWN SHORE TREES ON THE INTENSITY OF WATER MOVEMENTS IN A LAKE, (IN POLISH),
Wyzsza Szkola Rolnicza, Olsztyn-Kortowa (Poland). Instytut Hydrobiologii Ochrany Wodnego.
For primary bibliographic entry see Field 4C.
W75-00338

BOTTOM MACROFAUNA IN THE GOCZALKOWICE DAM RESEARVOIR IN THE YEARS 1965-1969, (IN POLISH),
Polish Academy of Sciences, Pszczyna. Hydrobiological Station.
E. Krzyzanek.
Acta Hydrobiol, Vol 15, No 2, p 189-196, 1973, Illus. English summary.

Descriptors: *Benthic fauna, Reservoirs, Hydrobiology.
Identifiers: Chironomus plumosus, Procladius, Unio pictorum, *Poland(Goczalkowice dam), Microfauna.

Investigations of the bottom macrofauna of the dam reservoir at Goczalkowice (Poland) were carried out from 1965-1969 as a continuation of those carried out from the beginning of its existence. In the years 1965-1967 a further decrease in the amount of bottom macrofauna was observed, but from 1968 there was a gradual increase. Oligochaeta and the larvae of Chironomidae (mainly Procladius and Chironomus plumosus) dominated quantitatively. The number of large Mollusca, mainly Unio pictorum, also increased. The upper and central zones were mot numerously populated by the bottom macrofauna. Usually the encountered forms had already been noted in previous years.--Copyright 1974, Biological Abtracts, Inc.
W75-00339

SECULAR VARIATION OF OXYGEN CHANGE IN THE DEEP WATER OF LAKE BIWA, (IN JAPANESE),
For primary bibliographic entry see Field 5C.
W75-00340

HYDROBIOLOGY OF THE PACHKAMAR RESERVOIR DURING THE FIRST YEARS OF ITS EXISTENCE, (IN RUSSIAN),
Akademiya Nauk Uzbekskoi SSR, Tashkent. Institut Zoologii i Parazitologii.
L. K. Sibirtseva, and L. I. Afanaseva.
Uzb Biol Zh. Vol 17, No 3, p 47-49. 1973.

Descriptors: *Reservoirs, Benthos, Zooplankton, *Hydrobiology.
Identifiers: *USSR(Pachkamar Reservoir), Hydrochemical studies.

Hydrochemical and hydrobiological data are presented on the flood zone of the Pachkamar reservoir, USSR. The species composition, numerosity and biomass of zooplankton and benthos was quite scanty during the 1st years of existence of the reservoir. The qualitative composition of aquatic invertebrates changed considerably. Rheophilic forms of benthos yielded to limnophilic. The fauna of the reservoir is represented mainly by a pelophilic complex. The reservoir belongs to the low-productivity class.--Copyright 1974, Biological Abstracts, Inc.
W75-00341

THE DISTRIBUTION AND NATURE OF AMINO ACIDS AND OTHER NITROGEN-CONTAINING COMPOUNDS IN LAKE ONTARIO SURFACE SEDIMENTS,
Canada Centre for Inland Water, Burlington (Ontario).
For primary bibliographic entry see Field 5B.
W75-00343

ANAEROBIC METABOLISM IN LAKE WASHINGTON SEDIMENTS,
Auburn Univ., Ala. Dept. of Fisheries.
For primary bibliographic entry see Field 5C.
W75-00344

COMPARATIVE PRODUCTIVITY OF FOUR CAROLINA LAKES,
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
For primary bibliographic entry see Field 5C.
W75-00345

WATER AND SALINE REGULATION IN LAKE CHAD, (IN FRENCH),
Office de la Recherche Scientifique et Technique Outre-Mer, Fort-Lamy (Chad).
J-P. Carmouze.
Cah O R S T O M Ser Hydrobiol. Vol 7, No 1, p 17-23. 1973. Illus. (English summary).

Descriptors: *Sedimentation, Salts, Regulation, Saline water intrusion.
Identifiers: *Chad(Lake Chad).

Hydric and saline regulation of Lake Chad is described from the residence time of the water and the major constituents. For this purpose, Lake Chad is considered as a steady-state system. A differential sedimentation of major constituents occurs in the lake itself.--Copyright 1974, Biological Abstracts, Inc.
W75-00346

SURVIVAL OF SCLEROTIA OF RHIZOCTONIA SOLANI IN LAKE WATER,
Florida Univ., Gainesville. Dept. of Plant Pathology.
For primary bibliographic entry see Field 5C.
W75-00348

METABOLITES OF AN ACTINOMYCES BIWAKI-B STRAIN, ISOLATED FROM SEDIMENT IN LAKE BIWA: IDENTIFICATION OF THE ODOROUS COMPOUNDS, GEOSMIN AND 2-METHYLISOPORNEOL, AND ANALYSIS OF FATTY ACIDS, (IN JAPANESE),
Kyoto Univ. (Japan). Faculty of Pharmaceutical Sciences.
For primary bibliographic entry see Field 5A.
W75-00349

FOOD AND FEEDING HABITS OF SOME EGYPTIAN FISHES IN LAKE QUARUN: I. TILAPIA ZILLII (CERV.) C. ACCORDING TO DIFFERENT SEXES,
S. A. Abdel-Malek.
Bull Inst Oceanogr Fish. 2, p 239-259. 1972. Illus.

Descriptors: *Fish diets, Feeding habits, *Diatoms, Lakes.
Identifiers: *Tilapia-zillii, *Egypt(Lake Quarum).

Data were collected and analysed over a 4-mo. period from Dec. 1969-March 1970. T. zillii of both sexes feed on plant material as well as on animal food. The males and females took nearly the same food items but with a slight difference in proportion. The percentage of fish with empty alimentary canals decreased gradually from Dec. 1969-March 1970. In Dec., 55.6% and 41.7% of the digestive tracts of males and females, respectively, were empty; in March, all the males had food in their alimentary tracts and 14.5% of the females had empty digestive tracts. The plant components eaten by T. zilli of both sexes were diatoms: (Coscinodiscus spp., Grammatophora spp., Lycmophora spp., Symedra spp., Cocconeis spp., Navicula spp., Diploneis spp., Gyrosigma spp., Nitzschia spp.), Cyanophyta (Microcystis spp., Oscillatoria spp., Lyngbya spp.); Polysiphonia spp.; Ectocarpus spp.; higher plant tissue and plant detritus. Animal organisms including Prorocentrum unicans, Nereis spp., Ostracoda, Acertia latisetosa, Gammarus spp., water insects, Hydracarina, Gastropoda, Abra ovata, Cardium edule, fish eggs, fish larvae, fish scales and animal detritus were used as food for Bolti (males and females). Insignificant quantities of inorganic particles were occasionally seen in the alimentary canals of the females in Feb. 1970 and March 1970. During Dec. 1969, Jan. and Feb. 1970, the plant material, especially Polysiphonia spp., diatoms and Cyanophyta were the most important food components for Bolti of different sexes, while the animal material was secondary. This was reversed in March 1970, when the animal organisms, particularly Nereis spp. and Gammarus spp., made up the principal food items for both males and females.--Copyright 1974, Biological Abstracts, Inc.
W75-00350

INFLUENCE OF THE CREATION OF ARTIFICIAL LAKES OF THE GREAT AFRICAN BARRAGES ON PARASITIC ENDEMICS: A COMPARATIVE STUDY OF AKOSOMA LAKE ON BLACK VOLTA AND NASSER LAKE ON THE NILE (EGYPT, SUDAN),
Institut Pasteur, Paris (France). Laboratoire d'Epidemiologie.
For primary bibliographic entry see Field 5C.
W75-00351

CHARACTERISTICS OF THE REPRODUCTION AND GROWTH OF THE TIULKA, A NEW COMPONENT OF THE FISH FAUNA OF THE KUIBYSHEV RESERVOIR, (IN RUSSIAN),
Kazan State Univ. (USSR). Dept. of Vertebrate Zoology.
V. A. Kuznetsov.
Biol Nauki. Vol 16, No 6, p 23-25. 1973.

Descriptors: *Fish populations, Reservoirs, *Reproduction, *Growth rate.
Identifiers: Clupeonella delicatula delicatula, *USSR(Kuibyshev reservoir).

The effect of abiotic and biotic factors was investigated on the reproduction and growth of the tiulka (Clupeonella delicatula delicatula) in the Sviyazh Bay of the Kuibyshev Reservoir (USSR), where it has penetrated from the south. A comparatively high effectiveness of reproduction of the tiulka is possible only with a spawning season water temperature of 14-18C, maximum duration of the vegetation season, and sufficient concentration of zooplankton for food. Between 1967 and 1971, these conditions coincided once in the northern part of the range in 1967. The tiulka grows more poorly in the Kuibyshev Reservoir than in southern bodies of water (e.g., in the North Caspian and in the Kakhov and Kremenchug Reservoirs) but in years with a favorable vegetation season it can grow even better.--Copyright 1974, Biological Abstracts, Inc.
W75-00353

DETERMINATION OF GENERATION TIME AND PRODUCTION OF BACTERIOPLANKTON BY MODIFICATION OF THE TECHNIQUE OF CLOSED VESSELS, (IN RUSSIAN),
For primary bibliographic entry see Field 5C.
W75-00354

THE NUMBER OF BACTERIA IN THE WATER OF KUIBYSHEV RESERVOIR AND ITS CORRELATION WITH THE AMOUNT OF ORGANO-MINERAL SUSPENSIONS, (IN RUSSIAN),
For primary bibliographic entry see Field 5B.
W75-00355

ON FISH OF THE GENUS CHRYSICHTHYS FROM LAGOONS AND RIVERS OF THE IVORY COAST, (IN FRENCH),
C. Chauvet.

Tethys. Vol 4, No 4, p 981-988. 1972, Illus, English summary.

Descriptors: Fish, Ivory Coast, *Africa(Malagasy Republic).
Identifiers: *Chrysichthys.

A new species of Chrysichthys lives in the Agnebi river. The Ivoirian fishermen earn enough money through the fishing and profitable sale of this fish. The fish spawns when the salinity is lower after the June rains. The young fish fed with village litter grow well.--Copyright 1974, Biological Abstracts, Inc.
W75-00361

FALL STORM AND HIGH LAKE LEVELS SPELL DISASTER AROUND THE GREAT LAKES,
National Weather Service, East Lansing, Mich.
N. D. Strommen.
Mariners Weather Log, Vol 17, No 2, p 66-69, March 1973. 6 fig.

Descriptors: *Great Lakes, *Water levels, *Storm structure, Inland waterways, Lakes, Michigan, Ohio.

Storms moving toward the Great Lakes Basin are always of concern to ships operating in these inland waters. Fall is a period of maximum turbulence and storms occurring in the fall take a heavy toll on shipping. On November 13-14, 1972 rising waters forced over 15,000 persons to flee from their homes and caused unharvested fields to be flooded. Details are given on the history of the storm. Water levels reached record levels. A graph of the water level as recorded by the Lake Survey gage at Toledo is shown. The highest level recorded there was 575.98 ft above the International Great Lakes Datum at 1500, November 14, or 88.6 in. above the 1955 low water datum for Lake Erie. On Saginaw Bay, the limits of the water level gage at Essexville were exceeded but the Coast Guard reported the highest water at the mouth of the Saginaw River as 68 in. above datum. These record levels topped by the pounding of 8- to 12-ft waves forced the evacuation of over 15,000 persons. Total losses were estimated at $7.2 million in Michigan and $22 million in Ohio. (NOAA)
W75-00377

THE 1972-73 GREAT LAKES ICE SEASON,
National Weather Service, Cleveland, Ohio.
D. E. Boyce.
Mariners Weather Log, Vol 17, No 5, p 285-288, September 1973. 3 fig, 3 tab.

Descriptors: *Great Lakes, *Ice cover, *Navigation, Freezing, Lakes.
Identifiers: Icebreakers.

A major advance in the extension of navigation on the Great Lakes was accomplished during the 1972-73 ice season, thanks to a mild winter and close cooperation between private industry and government agencies. An additional week was added to the fall season, which didn't end until February 8, 1973. Navigation resumed less than 2 mo later on March 28. Both dates set new records. The Great Lakes Region is known for its extreme and frequently changeable weather, but the ice season of 1972-73 will stand for some time to come as one of the most unique. More commercial shipping companies and more ships than ever before participated in the extended winter operation season. Icebreaking assists, during freezeups early in the season went up significantly, compared to the same period last year. However, the mild opening season produced few problems, and total assists for the season decreased from 466, during 1971-72, to 263, during 1972-73. (NOAA)
W75-00378

PERMITS FOR CONSTRUCTION OF SHORE PROTECTION WORKS ON LAKE MICHIGAN.
Wisconsin Univ., Madison. Sea Grant Program.
Wisconsin University Sea Grant Advisory Report No 406, August 1974. 14 p.

Descriptors: *Shore protection, *Lakes, *Subsurface drainage, *Lake Michigan, Water levels, Construction, Permits, Real property, Damages.
Identifiers: *Wave action, Licenses, Ground water seepage, Sea grant program.

In recent years, high lake levels combined with natural wave action and ground water seepage have been causing severe damage to the Lake Michigan shoreline. This pamphlet is designed to provide lakeshore property owners with a guide to permit procedures and authorizing agencies for construction of shore protection works on Lake Michigan. (NOAA)
W75-00383

THE 1973-74 GREAT LAKES ICE SEASON,
National Weather Service, Cleveland, Ohio.
D. E. Boyce.
Mariners Weather Log, Vol 18, No 5, p 298-303, September 1974. 5 fig, 3 tab.

Descriptors: *Great Lakes, Lakes, Iced lakes.
Identifiers: Freezeup, Shipping, Ice cover, Ice season.

Great Lakes mariners were tested to their fullest during the 1973-74 ice season--especially on the northern waters. Below-normal temperatures brought severe ice conditions to Lake Superior, the Straits of Mackinac, and the St. Mary's River by early February, and ended shipping abruptly on February 7, 1974--1 day short of the record established the previous year. The spring 1974 opening also proved to be unusually challenging in the upper Lakes. Ship damage was common and at least three lives were lost in ice-related accidents. Temperatures over the southern waters were above normal for the third straight year and an easy season was the rule there. (NOAA)
W75-00385

FIFTY-FIFTH ANNUAL MEETING OF THE AMERICAN GEOPHYSICAL UNION APRIL 8-12, 1974. PROCEEDINGS IFYGL SYMPOSIUM.
National Oceanic and Atmospheric Administration, Rockville, Md.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974. 173 p, numerous fig, tab, ref, August 1974.

Descriptors: *Lakes, *Lake Ontario, *Great Lakes, *Limnology, *Hydrology, Meteorology, Management, Ecology, Pollution, Surveys, Water pollution effects.
Identifiers: Lake environments, Freshwater environments.

This issue contains eleven papers presented at the Fifty-fifth Annual Meeting of the American Geophysical Union held April 8-12, 1974, in Washington, D.C. They constitute the proceedings of the symposium of the International Field Year for the Great Lakes encompassing its history, a scientific overview, the major disciplinary areas of study, and results of some of the hydrological, meteorological, and limnological studies. Papers are separately abstracted. Titles include: Planning for the International Field Year for The Great Lakes; IFYGL: Scientific Overview; An Estimate of the Water Balance of Lake Ontario During International Field Year for the Great Lakes; Rainfall Measurements During Hurricane Agnes; The IFYGL Lake Meteorology Program; IFYGL Atmospheric Boundary layer Program--Summary and Status of Results; Energy Balance of Lake Ontario; IFYGL Water Movement Program--A Post Field Work Review; The Internal Wave Response of the Lake Ontario Thermocline to the Passage of a Storm, 9-10 August 1972; Biology-Chemistry Program for the International Field Year for the Great Lakes; and The IFYGL Fisheries Study. (See W75-00393 thru W75-00403) (NOAA)
W75-00392

PLANNING FOR THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES,
Atmospheric Environment Service, Toronto (Ontario).
T. L. Richards.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 1-7, August 1974.

Descriptors: *Lakes, *Planning, *Limnology, *Great Lakes, Lake Ontario, Research facilities, Lake basins.
Identifiers: International hydrological data.

A very large and comprehensive interdisciplinary program--the International Field Year for the Great Lakes--was formulated under the aegis of the Canadial and U.S. national Committees for the International Hydrological Decade. An International Steering Committee selected Lake Ontario as the centre of action and chose April 1st, 1972--March 31st, 1973 as the year of intensive investigations. Advisory Scientific Working Groups composed of leading lakes experts were asked to identify the major problems and to specify the programs and facilities required to solve these problems. Grass roots scientific reaction and interaction came through a series of workshops held over a four-year period. Day-to-day management of the resulting program came through a Joint Management Team and six Scientific Panels which have responsibilities for specific portions of the program. In addition, a number of support subcommittees were formed to deal with such important details as data management, publications and the coordination of ships schedules and data collection facilities. (See also W75-00392) (NOAA)
W75-00393

IFYGL: SCIENTIFIC OVERVIEW,
International Field Year for the Great Lakes Project Office, Rockville, Md.
E. J. Aubert.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 8-21, August 1974. 5 fig, 4 tab.

Descriptors: *Lakes, *Limnology-general, Lake Ontario, Great Lakes, Data collections, Water balance, Boundary layers, Energy budget, Projects.

The International Field Year for the Great Lakes (IFYGL) is a joint United States-Canadian experimental field program designed to improve knowledge of the limnology, hydrology, and meteorology of Lake Ontario and the Ontario basin. Major accomplishments to date include the preparation of a comprehensive four-volume IFYGL Technical Plan and, in accordance with this plan, a comprehensive data collection effort from April 1972 to March 1973. Processing of these data, both in the United States and Canada, is well underway, and some analytical results have begun to appear. Work on some 160 United States and Canadian individual IFYGL tasks is progressing and will be completed within the next 4 years. These taks serve to support six major projects: terrestrial water balance, lake meteorology-atmospheric water balance, atmospheric boundary layer, energy balance, water movement, and biology and chemistry. The status of these projects and some research highlights are discussed. (See also W75-00392) (NOAA)
W75-00394

AN ESTIMATE OF THE WATER BALANCE OF LAKE ONTARIO DURING INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES,
Corps of Engineers, Detroit, Mich.; and Department of Energy, Mines and Resources, Cornwall (Ontario). Great Lakes-St. Lawrence Study Office.
B. G. DeCooke, and D. F. Witherspoon.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 22-39, August 1974. 7 fig, 2 tab, 6 ref.

Descriptors: *Lakes, *Water balance, *Hydrologic cycle, *Lake Ontario, Great Lakes evaporation, Precipitation(Atmospheric), Inflow, Runoff.

This paper presents a brief description of the physical characteristics of the Lake Ontario basin and the hydrologic relationships which affect its water balance. Estimates of the various elements of the water balance during the International Field Year for the Great Lakes are presented. These are compared with the recent historical period (1940-1969). Lake surface evaporation is computed as a residual of the water balance and comparisons are made between IFYGL data and long term values. (See also W75-00392) (NOAA)
W75-00395

RAINFALL MEASUREMENTS DURING HURRICANE AGNES BY THREE OVERLAPPING RADARS,
Center for the Environment and Man, Inc., Hartford, Conn.; and Atmospheric Environment Service, Toronto (Ontario).
J. W. Wilson, and D. M. Pollock.
Proceedings International Field Year for the Great Lakes, IFGYL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 40-55, August 1974. 8 fig, 3 tab, 10 ref.

Descriptors: *Lakes, *Rainfall, *Hurricanes, *Meteorological data, Great Lakes, Lake Ontario, Precipitation(Atmospheric), Measurement.
Identifiers: *Radar measurements, *Hurricane Agnes.

As part of the International Field Year for the Great Lakes, rainfall measurements were made for Hurricane Agnes over the Lake Ontario watershed by two C-band radars and one S-band radar. Comparison between radar and gage rainfall measurements show there is considerable time and space variability in the accuracy of the radar rainfall estimates. Because of the high correlation between radars measuring rain over the same area, it is concluded that this observed variability is due to meteorological causes rather than radar measurement errors. The Z-R relationship as measured by the distrometer remained constant throughout the storm; thus, it is improbable that the variability in the radar accuracies resulted from changes in the Z-R relationship. Some of the larger radar overestimates could be attributed to evaporation below the radar beam. Because of precipitation growth below the beam, incomplete beam filling and interception of the freezing level, the radar underestimated the rainfall for radar ranges where the beam was greater than 6000 ft above the earth. For areas where the beam height was less than 6000 ft, over 90% of the radar estimates were within a factor of 1.3 of the gage measurements. (See also W75-00392) (NOAA)
W75-00396

THE IFYGL LAKE METEOROLOGY PROGRAM,
National Oceanic and Atmospheric Administration, Washington, D.C.; and Atmospheric Environment Service, Toronto (Ontario).
E. M. Rasmusson, and J. A. W. McCulloch.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 56-69, August 1974. 4 fig, 13 ref.

Descriptors: *Lakes, *Meteorological data, *Hydrologic cycle, Heat balance, Water vapor, Precipitation(Atmospheric), Evaporation, Canada, Lake Ontario.
Identifiers: *Atmospheric processes.

This program consists of a number of tasks designed to investigate the effect of Lake Ontario on atmospheric processes. International projects consist of (1) an evaluation of the atmospheric budgets of heat, water vapor and momentum, using data from a network of 6 shoreline rawinsonde stations, (2) an evaluation of the precipitation regime over the lake and basin using direct measurements and radar observations, (3) an evaluation of the mean evaporation from the lake for periods of one to two weeks, (4) collection of data from Class A and X-3 evaporation pans from which values of 'shallow' lake evaporation will be obtained by 4 independent techniques. In addition to the 4 international projects, there are a number of Canadian projects designed to collect and analyze data from the shoreline meteorological network, lake towers, and infrared thermometer surveys. The status of the program, and results obtained to date, are reviewed. (See also W75-00392) (NOAA)
W75-00397

IFYGL ATMOSPHERIC BOUNDARY LAYER PROGRAM. SUMMARY AND STATUS OF RESULTS,
Canada Centre for Inland Waters, Burlington (Ontario).; and National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
F. C. Elder, J. Z. Holland, and J. A. Almazan.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 70-85, August 1974. 13 fig, 18 ref.

Descriptors: *Lakes, *Boundary layers, *Lake breezes, Heat flow, Water vapor, Momentum transfer, Carbon dioxide, Measurement, Wind velocity, Humidity, Turbulence, Lake Ontario, Great Lakes.
Identifiers: Sulfur dioxide, Lake-land breeze.

The IFYGL Boundary Layer Program includes studies of: surface fluxes of heat, water vapor and momentum; concentrations of carbon dioxide and sulfur dioxide; and the structure of the turbulent boundary layer of the atmosphere. Direct measurements of turbulent fluxes were made using instruments mounted on towers in the lake and on aircraft flying over the lake. Some results of these measurements from several Canadian and United States groups will be illustrated. Studies of the horizontal variation and time change of fluxes at the lake surface have been carried out using Canadian and United States buoy data on air and lake temperature, atmospheric humidity and wind velocity. Data on the horizontal coherence of eddies in the surface layer and examples of newly obtained information on the lake-land breeze phenomenon will also be shown. (See also W75-00392) (NOAA)
W75-00398

ENERGY BALANCE OF LAKE ONTARIO,
National Ocean Survey, Detroit, Mich. Lake Survey Center; and Canada Centre for Inland Waters, Burlington (Ontario).
A. P. Pinsak, and G. K. Rogers.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 86-101, August 1974. 4 fig, 2 tab, 12 ref.

Descriptors: *Lakes, *Energy budget, *Heat balance, *Evaporation, *Lake ice, *Iced lakes, *Lake Ontario, Great Lakes, Ice.
Identifiers: *Dimictic lakes, Ice observations.

Comprehensive IFYGL field observations provided an opportunity to define in detail properties of a large dimictic lake, evaluate terms of the energy budget equation, develop a heat balance for Lake Ontario and compare evaporation estimates with those from other techniques. As radiation from the sun is a primary heat source, a heat budget equation considering incident and reflected solar and infrared radiation, heat content, sensible and latent heat flux and net advection was used. A radiation model utilizing computed meteorological variables empirically verified is used to produce daily sums for radiation terms. Heat storage determinations utilize temperature profiles from weekly ship surveys. Areal ice observations in conjunction with an ice formation, growth, and decay model will be applied. This factor varies but is significant for heat storage and radiation flux estimates in temperature zones. Preliminary evaporation estimates compare with those utilizing other techniques but sensitivity of each term requires testing and verification. (See also W75-00392) (NOAA)
W75-00399

IFYGL WATER MOVEMENT PROGRAM. A POST FIELD WORK REVIEW,
Canada Centre for Inland Waters, Burlington (Ontario); and National Ocean Survey, Detroit, Mich. Lake Survey Center.
F. B. Bennett, and J. H. Saylor.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-Fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 102-128, August 1974. 13 fig, 8 ref.

Descriptors: *Lakes, *Water circulation, Diffusion, Upwelling, Currents(Water), Internal waves, Models, Great Lakes, *Lake Ontario, Waves(Water).
Identifiers: *Turbulent diffusion, Water movement, Surface waves.

Studies of water movement carried out on Lake Ontario between April 1972 and March 1973, which constitute one of the programs of the International Field Year on the Great Lakes, are described. The scientific basis and planning for these projects, which include investigations of surface waves, turbulent diffusion, upwelling, and horizontal current flow, are reviewed, as are the relationships of these investigations to those of internal waves in the lake, and to those of other IFYGL programs. The execution of the water movement studies, together with estimates of data recovery and, where available, results are discussed. Continuing efforts to match observations with the results predicted by analytical or numerical models are described. (See also W75-00392) (NOAA)
W75-00400

THE INTERNAL WAVE RESPONSE OF THE LAKE ONTARIO THERMOCLINE TO THE PASSAGE OF A STORM, 9-10 AUGUST 1972,
Wisconsin Univ., Milwaukee. Center for Great Lakes Studies.
C. H. Mortimer, and D. L. Cutchin.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 129-145, August 1974. 10 fig, 6 ref. Also Center for Great Lakes Studies Contribution No. 113.

Descriptors: *Lakes, *Internal waves, *Thermoclines, *Winds, *Lake Ontario, Storms, Great Lakes, Limnology, Meteorology.
Identifiers: Wind storms.

For the investigation of internal waves during the IFYGL Program 1972, three cross-sections of Lake Ontario were selected for repeated scans of the temperature/depth distribution, measured with depth-undulating instruments towed by research vessels on continuous shuttle cruises maintained for intervals of five or more days: Olcott to Oshawa; Braddock Point to Presque'ile, and Oswego to Prince Edward Island, but with no attempt to synchronize the crossings. The records -- combined with information on temperature and flow provided by instruments at fixed depths at several fixed stations along the sections -- showed large changes in thermocline depth (particularly near shore) following the passages of strong wind storms. One such episode is described here. (See also W75-00392) (NOAA)
W75-00401

BIOLOGY-CHEMISTRY PROGRAM FOR THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES,
National Environmental Research Center, Corvallis, Oreg. Canada Centre for Inland Waters, Burlington (Ontario).; and National Oceanic and Atmospheric Administration, Ann Arbor, Mich. Great Lakes Environmental Lab.
N. A. Thomas, and H. F. Watson.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974, p 146-156, August 1974. 3 fig, 1 tab, 3 ref.

Descriptors: *Lakes, *Water quality, *Management, Chemical analysis, Phosphorus, Nitrogen fixation, Nutrients, *Hazardous materials, Primary biological production, Mathematical models.
Identifiers: Water quantity, *Fish population estimates, Lake Ontario, Great Lakes.

The Biology and Chemistry Program is comprised of 37 tasks. These tasks were arranged to describe the biological components and interactions of the Lake Ontario system. The basic Biology and Chemistry Program was designed to further the scientific knowledge of the Great Lakes and improve water quality and quantity management. Projects include: A complete chemical analysis of materials entering, remaining, and leaving the lake; Sediment Phosphorus storage and release; Nitrogen Fixation by bluegreen algae; Sediment Oxygen Demand; Transport of Nutrients and Hazardous Materials within a Watershed; Benthic Organisms; Phytoplankton; Zooplankton; Cladophora distribution and Biomass; Algal Nutrition; Fish Population Estimates; Math Models; Load Distribution and Plankton Turnover Time; Horizontal and Vertical Distribution of Chlorophyll; Food Uptake and Utilization by Zooplankton; Primary Production by Algae; and Atmospheric Input. (See also W75-00392) (NOAA)
W75-00402

THE IFYGL FISHERIES STUDY,
Department of Lands and Forests, Picton (Ontario). Genora Fisheries Station; and Bureau of Sport Fisheries and Wildlife, Ann Arbor, Mich.
W. J. Christie, and J. A. Kutkuhn.
Proceedings International Field Year for the Great Lakes, IFYGL Symposium, Fifty-fifth Annual Meeting of the American Geophysical Union, April 8-12, 1974. p 157-166, August 1974. 1 fig, 10 ref.

Descriptors: *Management, *Fish, *Lakes, Surveys, Population, Fish management, Deterioration, Fisheries.
Identifiers: *Species composition, *Pollution effects, Lake Ontario.

Management initiatives aimed at restoring the ravaged fish stocks of Lake Ontario, are underway. The fish survey was designed as a first step in an on-going program to guide the management efforts. Collections of fish were made over the whole lake in all seasons except winter. Gillnets, seines, bottom and mid-water trawls were used. A total of 63 fish species were collected. Samples included a few deepwater sculpin which had been thought extinct, but included no deepwater ciscoes. As expected, smelt and alewife dominated the main trench of the lake and were found pelagically over deep water. Analysis of the data is not complete. Some of the problems encountered, are discussed. (See also W75-00392) (NOAA)
W75-00403

THE MOLLUSK COMMUNITIES OF LAKES PONCHARTRAIN AND MAUEPAS, LOUISIANA,
Louisiana Wild Life and Fisheries Commission, New Orleans. Div. of Oysters, Water Bottoms and Seafoods.
R. J. Dugas, J. W. Tarver, and L. S. Nutwell.
Available from the National Technical Information Service, Springfield, Va. 22161, as COM-74-10734 $3.25 in paper copy, $2.25 in microfiche. Technical Bulletin No 10, January 1974. 13 p, 10 fig, 10 ref.

Descriptors: *Benthic fauna, *Mollusks, *Lakes, *Brackish water, *Louisiana, Sampling, Fishery, Management, Estuaries, Salinity, Invertebrates, Mississippi, Environmental effects.
Identifiers: *Lake Ponchartrain(La), *Lake Maurepas(La), Pelecypods, Rangia cuneata.

Densities and distribution of the brackish-water communities of Lake Ponchartrain and Lake Maurepas are outlined. The lakes were divided into 99 three-mile-square grids with two Peterson grab samples taken in each grid. The results of these 198 samples, including ten molluscan species, are reported, as well as some apparent trends in the two lakes. (Katz)
W75-00435

ZOOPLANKTON SPECIES AS INDICATORS OF ENVIRONMENT,
Jyvaskyla Univ. (Finland). Dept. of Biology.
For primary bibliographic entry see Field 5C.
W75-00437

THE DIATOM SUCCESSIONS IN THE RECENT SEDIMENTS AND THE EUTROPHICATION OF RISTISELKA, LAKE PAIJANNE, CENTRAL FINLAND,
Hydrobiological Research Inst., Jyvaskyla (Finland).
For primary bibliographic entry see Field 5C.
W75-00439

THE EFFECT OF WASTE WATER ON FISH,
National Water Board of Finland, Helsinki.
For primary bibliographic entry see Field 5C.
W75-00457

WINTER CONDITIONS IN LAKE ERIE WITH REFERENCE TO ICE AND THERMAL STRUCTURE AND COMPARISON TO LAKES WINNEBAGO (WISCONSIN), AND MILLE LACS (MINNESOTA),
State Univ. of New York, Buffalo. Dept. of Biology.
K. M. Stewart.
In: Proceedings of the 16th Conference Great Lakes Research, p 845-857, 1973. 8 fig, 1 tab, 26 ref.

Descriptors: *Ice cover, *Stratification, *Lakes, *Heated water, Lake Erie, *Wisconsin, *Minnesota, Water temperatures, Winter, Iced lakes.
Identifiers: Lake Winnebago(Wis), Mille Lacs(Minn), Ice rafting, Monomictic lakes, Ice thickness, *Waste heat disposal, *Thermal structure.

A flotation-equipped helicopter was utilized to obtain data on ice thickness, extent of ice coverage and thermal conditions at 50 to 83 stations in Lake Erie from February to April 1972. Without considering pressure ridges and areas of ice rafting, the average (1972) maximum ice thickness in the Western, Central and Eastern Basins was about 25, 18 and 26 cm, respectively. In contrast to findings from smaller ice-covered lakes, Lake Erie has little to no vertical stratification during winter. In addition, the water temperatures are unusually cold. For example, in early March during one of the sampling periods, most of the water throughout the lake was less than 0.1 deg C. Thus Lake Erie tends to behave not as a dimictic lake, but rather as an extremely well-mixed monomictic lake, even though it is covered extensively with ice. Part of the reason for the cold water and lack of stratification is that the ice sheet acts as a giant movable 'sieve' with irregular openings and with some portions sealed completely. By comparison, a well-developed vertical stratification and parabolically shaped isotherms were found beneath the total ice cover of Lakes Winnebago (Wisconsin) and Mille Laes (Minnesota). The 1972 winter transects on Lake Erie suggest no obvious problems of waste heat disposal. (NOAA)
W75-00495

POWER PLANT THERMAL EFFLUENTS IN SOUTHEASTERN LAKE ONTARIO,
State Univ. Coll., Oswego, N.Y. Dept. of Earth Sciences; State Univ., Coll., Oswego, N.Y. and Lake Ontario Environmental Lab.
For primary bibliographic entry see Field 5B.
W75-00496

INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES.
National Oceanic and Atmospheric Administration, Rockville, Md.
International Field Year for the Great Lakes, IFYGL Bulletin No 10, May 1974. 15 fig, 10 tab, 25 ref.

Descriptors: *Great Lakes, *Diffusion, Lakes, Epilimnion, Thermocline, Hypolimnion, Remote sensing, Hydrology, Limnology, Meteorlogy, Climatology, Lake Ontario, Data processing.
Identifiers: Ground truth data.

In reporting on Canadian projects information is given on their large scale diffusion studies. Data management activities continued to receive major emphasis in the USA studies. Brief notes on both Canadian and USA scientific projects are included with some important supporting data. The status of the chemical intercomparison programs is described and both Canadian and US publications on IFYGL are listed. (NOAA)
W75-00501

HYDROLOGIC-ECONOMIC FEASIBILITY STUDY ON PRECIPITATION AUGMENTATION OVER THE GREAT LAKES,
Illinois State Water Survey, Urbana.
For primary bibliographic entry see Field 3B.
W75-00508

GREAT LAKES WATER LEVELS 1973. DAILY AND MONTHLY AVERAGE WATER SURFACE ELEVATIONS.
National Ocean Survey, Detroit, Mich. Lake Survey Center.
For primary bibliographic entry see Field 7C.
W75-00509

LAKE SUPERIOR BEGINNING-OF-MONTH WATER LEVELS AND MONTHLY RATES OF STORAGE CHANGES,
National Ocean Survey, Detroit, Mich. Lake Survey Center.
F. H. Quinn, and M. J. Todd.

NOAA Technical Memorandum NOS LSC R 4, February 1974. 41 p, 7 fig, 17 tab, 1 ref.

Descriptors: *Water levels, *Data acquisition, *Water level recorders, Lakes, *Lake Superior.
Identifiers: Storage changes.

Results are described from a study of Lake Superior beginning-of-month levels and rates of storage changes. These are listed for the period 1900-1972 of sufficient quality for scientific and planning studies. Also it indicates that the number and distribution of water level gages in the presently existing gage network are adequate for an accurate determination of beginning-of-month levels. (NOAA)
W75-00511

STUDIES ON THE ECOLOGY OF THE SCALLOP, PATINOPECTEN YESSOENSIS (JAY): 3. ON THE DIURNAL VERTICAL DISTRIBUTION OF SCALLOP LARVAE, (IN JAPANESE),
Hokkaido Abashiri Fisheries Experiment Station (Japan).
K. Maru, A. Obara, K. Kikuchi, and H. Okesahu.
Sci Rep Hokkaido Fish Exp Stn. 15, p 33-52, 1973, Illus. English summary.

Descriptors: *Scallops, Larvae, Spawning, Ecology, Distribution patterns.
Identifiers: *Japan(Lake Saroma).

Lake Saroma, Hokkaido is one of the best scallop seed supply centers in Japan. The quantitative plankton samplings were taken at intervals of 3 h during the day in May 29-30, June 16-17, 1968, and June 27-28, 1969, respectively, by means of pumping up the sea waters from several different depth layers. General limnological as well as meteorological observations were made simultaneously. Scallop larvae which collected at Station A were extremely less than those at station B. From this result, it can be estimated that the majority of scallop larvae are produced by the spawning beds within the lake. Scallop larvae were abundant at lower layers (6-12 m) during the day-time, but they increased in number at upper layers (0-3 m) before sunset and were distributed widely near the surface area at midnight. They became decreasing gradually from the upper layers after sunrise. No distinct differences were found in shell length of scallop larvae between station A and station B. It seems likely that spawning takes place at almost the same time in every spawning beds. Different growth stages were equally distributed in each layer regardless day or night. Scallop larvae were most abundantly collected by the vertical hauls of planktonnet at low tide at station B. It is certain that the tidal action is the most important factor-influencing the vertical distribution of scallop larvae. They are apt to sweep away upward during the flow and concentrate downward during the ebb.--Copyright 1974, Biological Abstracts, Inc.
W75-00518

FRESHWATER BIOTOPES AND THEIR IMPORTANCE FOR NORWEGIAN TERRESTRIAL VERTEBRATES, (IN NORWEGIAN),
T. A. Bakke.
Fauna (Oslo). Vol 26, No 2, p 112-129, 1973. English summary.

Descriptors: *Aquatic animals, Marshes, Aquatic habitats.
Identifiers: *Norway, *Biotopes.

The evolution of the different types of freshwater habitats in Norway is described. The preference for different types of freshwater habitats and the food of different terrestrial vertebrates (birds, mammals and reptiles), connected with such freshwater localities and marsh areas in Norway is tabulated. The dependence of these vertebrates on freshwater localities and marshes is due especially to the need for food. This food may be taken either in the water or on the land as several terrestrial animal groups such as amphibians, many insects and molluscs stem from aquatic habitats. The prime importance of freshwater localities and marsh areas in Norway as habitats and food-producers for many species of birds and mammals and 1 reptile is stressed and demands a closer insight into the treatment of these biotopes.--Copyright 1974, Biological Abstracts, Inc.
W75-00519

ON THE CHLOROCOCCAL FLORA OF FINLAND: III. EKENAES-TVAERMINNE REGION: 2. OEREN, (IN GERMAN),
G. Uherkovich.
Acta Bot Fenn. 99, p 1-18, 1973, Illus. English summary.

Descriptors: *Algae, Aquatic plants, Production.
Identifiers: *Peridinium, *Scenedesmus, *Finland, *Chlorococcal flora.

The algal flora and vegetation of 4 rock-pools on the treeless skerry Oren (in the outermost archipelago fringe at the Zoological station Tvarminne) are described. Two of the rock-pools had water bloom, 2 a 'bottom surface water bloom'. Of them 3 had luxuriant reproduction of chlorococcal algae, 1 a Peridinium water bloom. Of Chlorococcales, 28 taxa were identified, 20 belonging to Scenedesmus (new taxon: S. armatus Chod. var. armatus f. elegans). Of other algae, 14 taxa (Cyanophyta, Chrysophyta, Pyrrophyta, Chlorophyta) were listed. Isolates of Chlorococcales from these localities might be well suited for mass culture.--Copyright 1974, Biological Abstracts, Inc.
W75-00526

AN UNUSUAL OOMYCETE INFECTING ROTIFER EGGS,
Ohio State Univ., Columbus. Dept. of Botany.
For primary bibliographic entry see Field 5C.
W75-00527

ECOLOGICAL SEGREGATION AMONG THREE SPECIES OF MINNOWS (CYPRINIDAE) IN A MINNESOTA LAKE,
California Univ., Davis. Dept. of Animal Physiology.
P. B. Moyle.
Trans Am Fish Soc. Vol 102, No 4, p 794-805, 1973, Illus.

Descriptors: *Minnows, *Fish diets, *Minnesota, Lakes, Ecology.
Identifiers: *Cyprinidae, Shiners.

The life histories of the mimic shiner (Notropis volucellus), the common shiner (N. cornutus), and the bluntnose minnow (Pimephales notatus), from a small Minnesota Lake were compared to find out how temperate fish species segregate ecologically and how accurate dietary studies are for showing ecological differences among similar coexisting species. The 3 minnow species differ from each other in habitat, feeding behavior, organisms consumed, population age structure, and breeding habits. Mimic shiners occurred in large schools in shallow water and fed during the day, with peaks at dawn and dusk, on emerging and flying insects. They usually spawned in Aug. but did not spawn at all in some years. Bluntnose minnows were found in small schools in shallow water and in silty-bottomed clearings in the aquatic vegetation in deeper water. They fed continuously on bottom organisms and detritus and spawned in July. Common shiners were roving opportunists, feeding on whatever organisms were most abundant. Their numbers fluctuated but they were usually less abundant than the other 2 spp. They spawned in June. All 3 cyprinids were ecologically segregated from the noncyprinid species in the lake. Dietary studies can be reasonably good indicators of ecological differences if enough samples are taken at a variety of times and locations.--Copyright 1974, Biological Abstracts, Inc.
W75-00528

FOOD HABIT OF CRUCIAN CARP, CARASSIUS CARASSIUS LANGSDORFII TEMMINCK ET SCHLEGEL IN LAKE KORJIMA, (IN JAPANESE),
Hiroshima Univ. (Japan). Faculty of Education.
S. Mizuoka.
Bull Fac Educ Hiroshima Univ Part 3 (Sci Tech). 21, p 31-39, 1972, Illus. English summary.

Descriptors: *Carp, *Food habits, Fish food organisms, Fish diets.
Identifiers: Carassius carassius langsdorfii, *Japan(Lake Kojima).

The diurnal fluctuation, the seasonal fluctuation, and the fluctuation by length of the composition of food items and the amount of stomach contents of the crucian carp, C. carassius langsdorfii, was studied in Lake Kojima (Okayama-ken, Japan). The stomach contents were composed of a large number of Brachionus calyciflorus var. amphiceros, B. angularis var. bidens Keratella valga monstrosa, Copepoda, Chroococcaceae and Bacillariophyceae. The ratio stomach contents per body weight remained about the same above 9 cm in body length. The mean of the amount of stomach contents was the lowest from 0 a. m. and higher from 6 a.m. to 2 p.m. No diurnal fluctuation of the composition of food items was recognized. The amount of stomach contents was the largest from summer to autumn. It was larger in May, the breeding season, and the smallest in Jan. The seasonal fluctuation of the composition of food items was not recognized. A large percentage of the phytoplankton in gut was excreted. The zooplankton contained a large percentage of the food items which were assimilated.--Copyright 1974, Biological Abstracts, Inc.
W75-00530

THE BOOD HABITS OF THE DESERT PUPFISH (CYPRINODON MACULARIUS) IN QUITOBAQUITO SPRINGS, ORGAN PIPE NATIONAL MOMUNMENT, AQIZONA,
T. J. Cox.
J Ariz Acad Sci. Vol 7, No 1, p 25-27, 1972.

Descriptors: *Food habits, *Arizona.
Identifiers: Cyprinodon macularius, *Quitobaquito Springs(Ariz), *Desert pupfish.

During a series of investigations on the ecology and behavior of the form of the Desert Pupfish found in Quitobaquito Springs, a systematic study of the food habits of this species was carried out. Specimens (33) collected at 8 different times were analyzed. The fishes used were taken directly from the pond and placed into 10% formalin. After 24-48 h they were transferred to jars containing 70% ethanol, where they were kept until they were dissected. Dissection was carried out under a binocular microscope at varying degrees of magnification. The whole digestive tract was lifted from the fishes and opened carefully from front to rear. The material was suspended and broken up in a 70% ethanol solution for scrutiny. Occasionally material was identified at higher magnifications.--Copyright 1974, Biological Abstracts, Inc.
W75-00531

DISTRIBUTION OF THE INSECT FAUNA AND THE FOODCHAINS IN WATERCOURSES, (IN NORWEGIAN),
A. Lillehammer.
Fauna (Oslo). Vol 26, No 2, p 130-138, 1973, Illus. English summary.

Descriptors: *Aquatic insects, Distribution patterns, Ecosystems, *Food chains.
Identifiers: *Norway.

Investigations on the zonation of freshwater insect fauna were made. Insect functions in a running water ecosystem and their dependence on ecological factors, such as current, terrestrial vegetation, temperature and substratum, are discussed.--Copyright 1974, Biological Abstracts, Inc.

W75-00532

PALEOLIMNOLOGICAL STUDIES OF TESTACEAE FROM SEDIMENT CORES FROM LATNJAJAURE (ABISKO REGION; SWEDISH LAPPLAND) (IN GERMAN),
For primary bibliographic entry see Field 5C.
W75-00533

A STUDY OF BIOGEOCENOTIC INTERRELATIONS OF ENTOMOFAUNA COMPONENTS IN THE CENTRAL DNIEPER FRESH-WATER LITTORAL, (IN UKRAINIAN),
Akademiya Nauk URSR, Kiev. Instytut Zoologii.
A. A. Petrenko, and O. A. Petrusenko.
Dopov Akad Nauk Ukr RSR Ser B Heol Heofiz Khim Biol. Vol 35, No 5, p 466-468, 1973. English summary.

Descriptors: *Beetles, Aquatic animals, *Littoral.
Identifiers: Carabidae, Coleoptera, Staphylinidae, *USSR(Middle Dnieper area).

Data are presented on the species composition and some ecological interrelations between Carabidae and Stephylinidae (Coleoprera) in the sections of freshwater littoral under conditions of the Middle Dnieper area (USSR). Connections of these beetles with other organisms inhabiting this area are traced. The independence of the fresh-water littoral is proved as a specific unit equal to other flood biogeocenoses.--Copyright 1974, Biological Abstracts, Inc.
W75-00534

PHYSICOCHEMICAL ASPECTS OF LAKE MCILWAINE (RHODESIA): A EUTROPHIC TROPICAL IMPOUNDMENT,
Department of National Parks and Wild Life Management, Causeway (Rhodesia).
For primary bibliographic entry see Field 5C.
W75-00535

2I. Water In Plants

SOIL-WATER-PLANT RELATIONS UTILIZING DIVIDED ROOT SYSTEMS OF SOYBEAN,
Georgia Univ., Athens. Dept. of Botany.
B. E. Michel.
Available from the National Technical Information Service, Springfield, Va. 22161 as PB-236 590 $4.75 in paper copy, $2.25 in microfiche. Georgia Environmental Resources Center, Atlanta, Report ERC-1674, July 1974. 67 p, 23 fig, 6 tab, 51 ref. OWRT A-051-GA(1) 14-31-0001-4010.

Descriptors: *Soil-water-plant relationships, Irrigation efficiency, *Root systems, Soil moisture, *Soybeans, *Transpiration, Dehydration, Moisture deficit, Respiration, Stomata, *Wilting.
Identifiers: Divided root systems.

The root systems of soybean plants were divided between two sides when grown in a sandy clay loam soil in growth chambers. Soil moisture was measured either by a gravimetric imbalance or by an electrical resistance technique. Thermocouple psychrometers were used to measure water potentials of the lower stem. Psychrometric estimates of leaf and soil water potentials were obtained. Plants that have wilted and recovered turgor were found to transpire more slowly than before, primarily because of reduced stomatal aperture. The magnitude of the effect is related to the severity of wilting. Root resistance is less at higher flow rates, but stem water potentials show little change with changes in flow rates. That part of a root system in soil from which additional water is withheld will reduce the water in that soil to a low level though the water around the other roots is maintained at a high level. If permanently wilted plants had water added to half the root system, little water was transferred to the dry soil around the other half of the root system. As moisture fell below 8 percent, the stem water potential began to drop rapidly without affecting transpiration rate. Below 7 percent, roots in competition with others in wetter soil had their absorption rate slowed. At 6.5 percent, transpiration rate began to slow. Wilting symptoms appeared at from 6 to 5.5 percent. If the plant was receiving adequate water from part of the root system in wet soil, the balance of the root system dried surrounding unwatered soil to 5 percent. Finally, at a soil moisture of 4 percent, soybean plants became permanently wilted. (James-Geo Tech)
W75-00003

AGRO-ECOLOGIC EVALUATION OF WEED ASSCIATIONS IN CROATIAN-SLOVENIAN 'BETWEEN RIVERS' AREA, (IN SERBO-CROATIAN),
Zagreb Univ. (Yugoslavia). Zavod Opcu Proizvode Bilja.
For primary bibliographic entry see Field 3F.
W75-00100

SALVINIA NATANS (L.) ALL. AND SPIRODELO-SALVINIETUM SLAVNIC 1956 IN THE BYDGOSZCZ REGION, (IN POLISH),
Nicolas Copernicus Univ. of Torun (Poland). Inst. of Biology.
K. Kepczyniski, and S. Fabiszak.
Zesz Nauk Uniw Mikolaja Kopernika Toruniu Nauki Matprzyr Biol. 15, p 33-40. Illus. 1972.

Descriptors: Aquatic plants.
Identifiers: *Salvinia natans, *Spirodelo, *Visla Valley(Poland), *Poland.

In 1970 in the Visla valley (Poland), S. natans was found in old streams on the right bank across from Czarnowo, next to Ostromecko, across from Mozgowizno and near Pien. It grows mainly in stagnant or slow-flowing water, mostly in shallow, muddy areas. Less abundant were Glycerietum maximae, Scirpo-Phragmitetum, Phallaridetum arundinaceae, Acoretum calami, Oenantho-Roripetum, Myriophyllo-Nupharetum, Potametum lucentis and Hydrocharitetum morsus-ranae. The Spirodelo-Salvinietum association has a simple structure and is found in 2 layers. Most species were found in the top layer, and only Lemna trisulca and Utricularia vulgaris were found in the loose bottom layer.--Copyright 1974, Biological Abstracts, Inc.
W75-00101

ECOLOGY OF SOME NATIVE AND INTRODUCED FISHES OF THE SIERRA NEVADA FOOTHILLS IN CENTRAL CALIFORNIA,
California Univ., Davis. Dept. of Animal Physiology.
P. B. Moyle, and R. D. Nichols.
Copeia. Vol 1973, No 3, p 478-490, 1973. Illus.

Descriptors: *California, *Fish, *Ecology, Fish populations, Environmental effects, Streams, Mountains, Rainbow trout, Roach.
Identifiers: Catostomid, Catostomus-occidentalis, Cyprinid, Gambusia-affinis, Hesperoleucus-symmetricus, Lavinia-exilicauda, Lepomis-cyanellus, Lepomis-macrochirus, Micropterus-salmoides, Mylopharodon-conocephalus, Notemigonus-crysoleucas, Ptychocheilus-grandis, Sierra-Nevada.

Collections were made of fishes occurring in the streams of the Sierra Nevada foothills in Central California. Environmental factors associated with each collection were recorded. Correlation analyses indicated which environmental factors affected the distribution of 11 of the 21 spp. collected: Micropterus salmoides, Lepomis cyanellus, L. macrochirus, Gambusia affinis, Notemigonus crysoleucas, Lavinia exilicauda, Ptychocheilus grandis, Mylopharodon conocephalus, Hesperoleucus symmetricus, Catostomus occidentalis and Salmo gairdneri. The fishes were found to belong to 4 distinct fish associations, each found in a distinctive set of environmental conditions. The Rainbow Trout Association was found in the cold, clear permanent streams of the higher elevations. The California Roach Association was found in the small, warm intermittent tributaries to the larger streams. The Native Cyprinid-Catostomid Association was found in the larger low evelation streams. The Introduced Fishes Association was found in low elevation intermittent streams that were highly modified by man's activities.--Copyright 1974, Biological Abstracts, Inc.
W75-00175

STUDIES IN THE DYNAMICS AND CONTROL OF WOODY WEEDS IN SEMI-ARID QUEENSLAND: 2. CASSIA NEMOPHILA AND C. ARTEMISIOIDES,
Department of Primary Industries, Brisbane (Australia).
For primary bibliographic entry see Field 4A.
W75-00337

RAINFALL INTERCEPTION IN MIXED GRASS PRAIRIE,
Saskatchewan Univ., Saskatoon.
D. E. Couturier, and E. A. Ripley.
Can J Plant Sci. Vol 53, No 3, p 659-663, 1973, Illus.

Descriptors: *Interception, Grasslands, *Rainfall, Vegetation, Model studies, Prairies.

A model has been built that permits calculation of both gross and net interception loss from mixed grass prairie. This model has been applied to 2 complete growing seasons for which the net interception losses were calculated to be 14 and 22%. Under arid conditions, losses may be significant, particularly when much dead vegetation is present.--Copyright 1974, Biological Abstracts, Inc.
W75-00362

THE FUNGAL FLORA OF WATERHYACINTH IN FLORIDA,
Florida Univ., Gainesville. Dept. of Plant Pathology.
For primary bibliographic entry see Field 5G.
W75-00423

PHYTOSOCIOLOGICAL STUDY OF MANGROVES OF THE TULEAR REGION IN MADAGASCAR: 2. THE MANGROVE OF NORTHERN FIHERENANA, (IN FRENCH),
Aix-Marseille Univ., Marseille (France). Laboratoire de Phytosociologie Cartographique.
H. Weiss.
Tethyssuppl, 5, p 315-334, 1973, Illus. English summary.

Descriptors: *Mangrove swamps.
Identifiers: Avicennia officinalis, Bruguiera gymnorrhiza, Ceriops boiviniana, Fiherenana, Lumnitzera racemosa, *Malagasy-Republic, Rhizophora mucronata, Sonneratia alba, *Madagascar.

After the presentation of the geomorphological frame in which this mangrove is situated, mangrove tree distribution is described and correlated with topographic, pedologic, physico-chimic and historic features which command it. A map of distribution of species (Avicennia officinalis, Bruguiera gymnorrhiza, Rhizophora mucronata, Ceriops boiviniana, Sonneratia alba, Lumnitzera racemosa) and the results of many analyses of soils and interstitial waters.--Copyright 1974, Biological Abstracts, Inc.
W75-00443

PHYSIOLOGICAL RESPONSE TO MOISTURE STRESS AS A FACTOR IN HALOPHYTE DISTRIBUTION,
Urbana Coll., Ohio.
J. K. Detling, and L. G. Klikoff.
Am Midl Nat. Vol 90, No 2, p 307-318, 1973, Illus.

Descriptors: *Glycophytes, *Moisture stress, Respiration, Photosynthesis.
Identifiers: Distichlis spicata, Sarcobatus vermiculatus, Suaeda depressa, Suaeda fruticosa.

Research was conducted to determine seasonal water stress patterns in important species from 4 adjacent halophyte communities, and to evaluate their phytosynthetic and respiratory response to moisture stress. Suaeda depressa and S. fruticosa, which grew in the most saline areas of the study site, consistently had lower (more negative) water potentials than Sarcobatus vermiculatus or Distichlis spicata. This suggested that the distribution of these species may, in part, be controlled by their relative tolerances to severe moisture stress. Net photosynthetic rates of S. fruticosa were at a maximum at lower water potentials than S. vermiculatus or D. spicata. The more gradual decline in net photosynthesis at decreasing water potentials in these 3 halophytes, compared with more mesic glycophytes, suggests a further physiological adaptation to their saline desert environment. Rates of dark respiration appeared to decline very gradually in response to decreasing water potential in these species, indicating that many metabolic processes could continue with minimal disruption during periods of severe water stress.--Copyright 1974, Biological Abstracts, Inc.
W75-00520

RESPONSE OF COTTON (G. HIRSUTUM) TO PRE- AND POST- FLOWERING IRRIGATIONS,
College of Agriculture, Dharwar (India).
For primary bibliographic entry see Field 3F.
W75-00521

THE INFLUENCE OF LIGHT AND WATER DEFICIT UPON DIFFUSIVE RESISTANCE OF LEAVES OF VICIA FABA L,
Institute for Agricultural Research, Zaria (Nigeria).
A. H. Kassam.
New Phytol. Vol 72, No 3, p 557-570, 1973, Illus.
Identifiers: Leaves, Light, *Stomata, Vicia faba.

The resistance of the upper(ru) and lower (rl) surface of the leaf to diffusion of water vapor in V. faba was influenced differently by light and water deficit. ru saturated at about 100 Wm Sup (-2) while rl saturated at about 13 Wm Sup (-2). At a given light intensity rl was always smaller than ru. The difference in the density of stomata between the 2 surfaces of the leaf alone does not explain the magnitude of the difference between ru and rl for V. faba and other species. Impressions of the stomata of the 2 surfaces at different light intensities indicated that the stomata on the lower surface were more widely open than those of the upper surface. When stomatal response to light was not saturated, increase in leafwater deficit was accompanied by increase in ru and rl. Under saturating light intensities however, increase in leaf-water deficit did not affect ru and rl until leaves were flaccid and pressure potential close to zero; although the stomata on the upper surface closed at slightly higher water potentials than those of the lower surface. A dry treatment lasting 2 days, at the end of which the leaf was flaccid, affected the subsequent performance of the stomata while the leaf-water deficit was eliminated. This after-effect was much greater on ru than on rl, and complete recovery of the stomata on the upper surface took more than 2 days. Larger differences between ru and rl values are associated with larger lower to upper stomatal density ratios in a number of species. However, the ratios of ru/rl are much larger than the corresponding stomatal density ratios. It appears that in V. faba, and in a number of other species, the stomata of the lower surface are more widely open than those of the upper surface either at equal light intensity or when leaves are illuminated from above.--Copyright 1974, Biological Abstracts, Inc.
W75-00537

THE DENSITY OF STOMATA IN LEAVES OF TWO ECOTYPES OF PHRAGMITES COMMUNIS TRIN. IN SOUTHERN BOHEMIA,
Karlova Universita, Prague (Czechoslovakia). Dept. of Plant Physiology.
J. Pazourek.
Preslia (Prague). Vol 45, No 3, p 242-249. 1973. Illus.

Descriptors: *Stomata, Leaves.
Identifiers: *Czechoslovakia(Bohemia), *Phragmites communis.

The density of stomata and related characteristics were studied. In 2 ecotypes of P. communis, named according to the character of their habitats littoral and terrestrial, differences were found in the total number of stomata in a leaf, in the relation of the density of stomata in the adaxial epidermis to that in the abaxial epidermis in adult plants and in the density of stomata in developing plants but none in adult plants. No differences could be found in the number of stomata per unit of the fresh or dry weight. The gradients of all characteristics except for the relation of densities on both surfaces had an increasing tendency, as had also the values during the vegetation period. The subgradients in individual leaf blades greatly resembled each other by their character.--Copyright 1974, Biological Abstracts, Inc.
W75-00541

2J. Erosion and Sedimentation

RESERVOIR SEDIMENTATION: A COMPUTER SIMULATION,
Kansas Water Resources Research Inst., Manhattan.
W. M. Merrill.
Available from the National Technical Information Service, Springfield, Va. 22161 as PB-236 629 $3.75 in paper copy, $2.25 in microfiche. Contribution No. 142, August 1973. 120 p, 42 fig, 5 tab, 15 ref. OWRT A-041-KAN(1) 14-31-0001-3516.

Descriptors: *Simulation analysis, *Computer models, Sedimentation, Reservoirs, *Kansas, *Computer programs, *Illinois, *Sediment transport, *Turbidity currents.
Identifiers: Lake Decatur(Ill), Kanopolis Reservoir(Kan), Trap efficiency, Sediment deposition.

In the course of a pilot study to investigate the practicability of computer simulation in Kansas reservoirs, FORTRAN programs have been written to simulate deposition in Kanopolis Reservoir, Smoky Hill River, Kansas, and Lake Decatur, Sangamon River, Illinois. Both are on alluvial streams and have been carefully studied during their existence so that relevant information is abundant. They differ in size, shape, extent of controlled drainage area, trap efficiency, and in other ways that make experimentation with the models developed for each useful in the design of a more general program. The lakes are represented by two-dimensional networks of cells, each of which represents a specific and discrete area of several acres within the appropriate reservoir. Sediment enters at upstream ends and is transported (diffused) from cell to cell as currents slow and diffuse into deeper water. Turbidity currents, gravity flows in which sediment concentration is higher than elsewhere in the reservoir, flow along the bottoms in former river channels. Sediment is provided in increments calculated from measurements of accumulations and measured trap efficiencies in the actual reservoirs. The passage of time is simulated by the deposition, for example, of a 10-year increment of sediment; when all of the sediment has been deposited, ten years have passed. As sediment accumulates, an appropriate thickness is added to the floor of each cell, raising the elevation thereof, decreasing water depth, and gradually filling the reservoir.
W75-00004

THE SIGNIFICANCE OF SEDIMENT DEPOSITS IN LARGE LAKES AND THEIR ENERGY RELATIONSHIPS,
Canada Centre for Inland Waters, Burlington (Ontario).
P. G. Sly.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p383-396, 1973. 2 fig, 1 tab, 58 ref.

Descriptors: *Sedimentation, *Sedimentology, *Sediment distribution, *Sediment transport, *Germorphology, *Lake sediments, Waves(Water), Density currents, Water circulation, Seiches, Lakes, Great Lakes, Energy budget, Turbidity currents.

Sediment deposits of large lakes, although strongly influenced by the characteristics of their source material (basinal), reflect the changes of various energy controlled processes with time and the comparable, and associated, horizontal and vertical components. In large lakes the distributions, movements and behavior of sediments reflect their low energy environment which is marked by limited wave action, restricted current circulation, and generally tideless conditions; only in the shallower and nearshore areas are significant erosional-transportative processes active. Transportational-depositional processes remain the dominant feature in most lakes. The occurrence of turbidity, density and/or slump induced sediment distributions may, however, add a further element which relates to the characteristics of basin bathymetry and geometry. (See also W75-00029) (Gibb-ISWS)
W75-00081

SEDIMENTATION AND TRANSPORT OF PARTICLES IN LAKE KINNERET TRACED BY CS-137,
Weizmann Inst. of Science, Rehovoth (Israel). Isotope Dept.
M. Stiller, and G. Assaf.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 397-403, 1973. 2 fig, 2 tab, 15 ref.

Descriptors: *Sedimentation, *Fallout, *Tracers, *Radioisotopes, *Sedimentation rates, *Lakes, Sediment transport, Sampling, Hydrology.
Identifiers: Cs-137, *Israel(Lake Kinneret).

Use of fallout Cs-137 as a tracer for sedimentation and transport of particulate matter in Lake Kinneret is described. The location of the sediment layer containing maximum Cs-137 concentration permits the estimation of rates of sedimentation in the range of 5 to 8 mm per year. When rates are lower than 4 to 5 mm per year, this method gives too high a value. At nearshore sites, having an appreciable detrital deposition, the layer containing the Cs-137 activity peak does not necessarily coincide with the fallout peak. However, the integrated Cs-137 deposited at each site in the lake proves to be quite a reliable measure of sedimentation. It was shown than an equal amount of direct fallout and a variable amount of Cs-137, originating from the catchment area, are deposited. The variable amount of Cs-137 in the sediments depends upon distance from the Jordan influx into the lake. It was also shown, that the variable amount of Cs-137 traces the horizontal transport and settling of particulate matter in the lake, thus permitting an

alternative estimate of the sedimentation rate. (See also W75e00029) (Yang-ISWS)
W75-00082

MODEL TEST ON LAKE VELENCE FOR STUDYING FLOWS AND SEDIMENT CAUSED BY WIND,
Research Inst. for Water Resources Development, Budapest (Hungary).
Zs. Akantisz.
In: Hydrology of Lakes Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 404-409, 1973. 6 fig.

Descriptors: *Sedimentation, *Model studies, *Lake morphology, *Lake sediments, Currents(Water), Lakes, Hydrology, On-site investigations, Hydraulic models, Flow, Flow measurement, Water quality.
Identifiers: *Hungary(Lake Velence), Reeds.

Model tests on Lake Velence to identify flow conditions and sediment movement were performed. The model was made of concrete. To reproduce the sediment particles rolling on the bottom and suspended by wave action, soft sawdust treated with chlorinated water was used. Brushes of fibris were used to reproduce the reeds. The wave action and current were generated by blowers. The currents at the bottom of the model were in good agreement with those observed in prototype. The verification tests proved the model to be a true replica of the prototype as far as the currents induced by northwest wind are concerned. (See also W75-00029) (Yang-ISWS)
W75-00083

HYDRAULIC MODEL STUDY OF SEDIMENT MOVEMENT AND CHANGES IN THE BED CONFIGURATION OF A SHALLOW LAKE,
Research Inst. of Water Resources Development, Budapest (Hungary).
O. Gyorke.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 410-416, 1973. 2 fig, 4 ref.

Descriptors: *Sedimentation, *Sediment distribution, *Sediment transport, *Hydraulic models, Seiches, Waves, Wind velocity, Lakes, Model studies.
Identifiers: *Hungary(Lake Balaton), Wind energy, Lake bed movement.

Lake Balaton, the largest lake in Central Europe, situated in the western part of Hungary, is 70 km long and has a surface area of about 600 sq km. On the northern side of the Bakony Range rises to 250 to 300 m above the lake level. The average depth of the lake is no more than 3.3 m and silting is extremely severe in the southwest end of the lake. A three-dimensional hydraulic model (horizontal scale 1 to 1000) was used to obtain a clear picture on sediment movement and bed formation processes and to further suggest hydrotechnical measures for delaying silting of the bay in the southwest end of the lake. Sediment concentrations can be seen to respond rather sensitively to wind conditions and fetch lengths, i.e., to the energy content of the waves. However, due to the influence of the surrounding mountain ranges some additional observations are considered necessary before relationships of general validity for such shallow lakes can be obtained. (See also W75-00029) (Gibb-ISWS)
W75-00084

THE SHORE DYNAMICS OF A MOUNTAIN PLAIN RESERVOIR OF THE AZERBAIJAN SSR,
Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Institut Geografii.
S. G. Rustamov, and Sh. B. Kchalilov.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 417-422, 1973. 2 fig, 4 ref.

Descriptors: *Sedimentation, Shores, Reservoirs, *Reservoir silting, *Waves(Water), *Bank erosion, *Winds, Bays, Seiches, Avalanches, Landslides, Alluvium, Lakes, Turbidity, Water level fluctuations, Geomorphology, Currents(Water).
Identifiers: Granulometric composition, *USSR(Azerbaijan SSR-Mingechaur Reservoir), Dynamics of shore erosion, Coastal slopes, Clastic deposits, Wind-induced currents.

Results were presented of field investigation of shore erosion due to wind generated waves; extreme change in water level; and silting of the reservoir, river mouth, and bays conducted in the Mingechaur Reservoir of the Azerbaijan SSR. More than 30 reservoirs with volumes from 1,000,000 cu m to several cubic kilometers are present in the Azerbaijan SSR. The Mingechaur Reservoir is the largest and most well defined among them with an area of 625 sq km and a volume of 16 cu km. The reservoir shores are composed of easily eroding clay and sand deposits, with slopes falling steeply toward the lake. The height of the shore reaches 80 to 100 m. An active wind and wave regime, a considerable level of oscillation amplitude (16 m), as well as great depth caused intensive shore erosion. During the early years of operation, shore damage reached as much as 20 m per year and gradually reduced to 9 m. The shore erosion deposited an average of 2.8 million tons of sand and clay every year in the lake resulting in an accumulative new shore 30 km in length. Variations in turbidity, granulometric composition, density, and thickness of the deposited layer were observed by the reservoir width. The erosion process accounted for an annual sediment deposit of 0.56 cm in the lake bed. (See also W75-00029) (Bhowmik-ISWS)
W75-00085

THE ROLE OF HYDROLOGICAL AND GEOLOGICAL PROCESSES IN THE FORMATION OF SHORES AND BEDS OF LARGE STORAGE RESERVOIRS,
Perm State Univ. (USSR).
Y. M. Matarzin, and I. A. Pechorkin.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 423-427, 1973. 1 tab.

Descriptors: *Sedimentation, *Reservoirs, *Geomorphology, *Lake shores, Bank erosion, Abrasion, Landslides, Water table, Hydrology, Deposition(Sediments), Lake sediments, Hydrologic aspects, Hydrobiology, Slopes, Geology.
Identifiers: *USSR(Kama Reservoirs), Hydrochemical process, Off-shore deposition.

General theses about the formation and man-made reservoirs as new geographical bodies were discussed on the basis of long-term research on the Kama cascade reservoirs. The role of hydrological and geological processes in the formation of reservoir basins was shown and the extent of their effects in different regions and zones depending on the lithologic structure was described. Based on the criteria of the Kama reservoirs and the determinig factors producing classification, the principal genetic types of shore formation were examined. The intensity and general scales of change of shore slope can be characterized by features of the formation of a complex of shallow and deep-water zones. (See also W75-00029) (Yang-ISWS)
W75-00086

SEDIMENT BALANCE OF THE VOLGA RESERVOIRS,
Akademiya Nauk SSSR, Moscow. Institut Biologii Vnutrennykh Vod.
N. A. Ziminova.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 428-431, 1973. 2 tab, 3 ref.

Descriptors: *Sedimentation, Sedimentology, *Geomorphology, *Sediment discharge, *Sediment load, *Sediment yield, Suspended solids, Bank erosion, Lake morphology, Lake sediments, Lakes, Hydrology, Shoals, Reefs.
Identifiers: *USSR(Volga Reservoirs).

Sediment balances were compiled for the Ivankova, Uglich, Rybinsk, Gorky, and Kujbyshev Reservoirs. These reservoirs have volumes from 1.2 cu km to 58 cu km and are used for seasonal regulation, except the Rybinsk Reservoir which is used for yearly regulation. The watersheds of the Ivankovo, Uglich, and Rybinsk Reservoirs yield annual river turbidities less than 25 g per cu m, while the watershed of the Gorky Reservoir yields 25 to 50 g per cu m, and that of the Kujbyshev 50 to 1000 g per cu m. The main input of the Volga Reservoir sediment balance is the product of bank and bed abrasion (60 to 80% of the total input). River suspended sediment discharge accounts for 20 to 40% and that derived from plankton and higher aquatics accounts for 1 to 5% of the total input. Sedimentation accounts for 60 to 98% of the output and suspended sediment discharge accounts for the remaining 2 to 40%. (See also W75-00029) (Gibb-ISWS)
W75-00087

SPECTRAL REFLECTANCE OF WATER CONTAINING SUSPENDED SEDIMENT,
Agricultural Research Service, Chickasha, Okla. Southern Great Plains Watershed Research Center.
B. J. Blanchard, and R. W. Leamer.
In: Remote Sensing and Water Resources Management, Proceedings No 17, p 339-347, June 1973. 9 fig, 6 ref. American Water Resources Association, edited by K. P. B. Thomson, R. K. Lane, and S. C. Csallany.

Descriptors: *Remote sensing, *Reflectance, *Suspended solids, *Lake sediments, Water quality, Algae, Light, Infrared radiation, Photography, *Pollutant identification.

A spectral radiometer, measuring radiation in the visible and near-infrared portion of the spectrum, was used to examine (1) different concentrations of red, black, and gray clay particles in water, and (2) several samples of natural pond water containing sediment. Four of the pond samples had algae present. Density measurements were made of color and color infrared film photographs of the samples exposed at the same time as the radiometer measurements. Reflectance curves in the near-infrared region show very little change caused by changing sediment concentrations. However, reflectance curves in the visible portion of the spectrum are sensitive to very low concentrations (less than 200 ppm suspended solids) of sediment with similar characteristics. The samples containing algae showed a good possibility of detecting algae by ratioing the reflectance near wavelength 570 nm with the reflectance at 680 nm. Response at 570 nm appears to be related to the suspended sediment. Results using the film density measurements also show promise for use in estimating low sediment concentrations; however, the best combination of film and filter are not known for the different sediment characteristics. (ARS)
W75-00104

METHOD AND APPARATUS FOR DETECTING PARTICULATE MATERIAL IN FLOW STREAM,
Mobil Research and Development Corp., New York City. (Assignee).
W. F. Baldwin, and L. D. Mullins.
United States Patent 3,816,773. Issued June 11, 1974. Official Gazette of the United States Patent Office, Vol 923, No 2, p 771, June, 1974.

Descriptors: *Patents, *Flow, *Fluids, *Sand, Automation, Pollutant identification.
Identifiers: *Particulate matter, Detection.

A system was patented for detecting the presence of particulate material such as sand, in a fluid stream flowing through a conduit. The system comprises an acoustical probe which is positioned directly into the flow stream. The probe has a housing in which a transducer (piezolectric crystal) is suspended. The housing is filled with oil to acoustically couple the transducer to the housing. Particulate material in the flow stream gives up kinetic energy upon striking the housing of the probe which in turn excites the transducer to generate an output signal having a representative frequency component. The system includes circuitry which amplifies and filters the output signal to provide an alarm, activated when a certain sand content condition in the flow stream is exceeded. (Prague-FIRL)
W75-00178

RECENT SEDIMENTS OF THE CENTRAL CALIFORNIA CONTINENTAL SHELF, PILLAR POINT TO PIGEON POINT. PART C. INTERPRETATION AND SUMMARY OF RESULTS,
California Univ., Berkeley. Coll. of Engineering.
P. Wilde, J. Lee, T. Yancey, and M. Glogoczowski.
Available from NTIS, Springfield, Va 22161 as AD-773 464, Price $7.50 printed copy; $4.75 microfiche. Hydraulic Engineering Laboratory Technical Report HEL-2-38, October 1973. 83 p, 38 fig, 7 tab, 73 ref, append. USACE Contract DACW-72-67-C-0015.

Descriptors: *Sediments, *Continental shelf, *California, Mineralogy, Provenance, Sedimentation, Sedimentology, Sediment transport, Stratigraphy, Sea level.

Grain size, heavy mineral, and organic contents were analyzed for 43 marine and 9 intertidal and fluvial samples from the area landward of 90 meters depth (50 fathoms) from Pillar Point to Pigeon Point, California, between the Golden Gate and Monterey Bay. The grain size of the sediment decrease off shore except for a nose of coarser sediment from -36 to -50 meters extending from the north of the latitude of Half Moon Bay. The heavy minerals are dominated by hornblende with varying amounts of augite and hypersthene. Franciscian minerals are found only in trace amounts. Three major source areas for the surface sediment are apparent (a) a great valley-Sierran source related to the sediments of the present San Francisco offshore bar; (b) a local source related to the drainage basins now emptying directly into the area off shore; (c) a quartz diorite source presumably montara to the north. The major distribution pattern of the sediment may be explained by the superimposition of local stream drainage on the shelf on relict sediment from the north during lower stands of sea level with limited reworking and mixing of sediments at province boundaries during the last rapid rise of sea level and by partial homogenation of local sediment during a slow rise in sea level. (Knapp-USGS)
W75-00222

MEASUREMENT OF VISCOELASTIC PROPERTIES OF SOME RECENT MARINE SEDIMENTS BY A TORSIONALLY OSCILLATING CYLINDER METHOD,
Naval Postgraduate School, Monterey, Calif.
S. B. Kramer.
Available from NTIS, Springfield, Va 22161 as AD-769 417, Price $4.75 printed copy; $2.25 microfiche. M Sc Thesis, Naval Postgraduate School, September 1973. 79 p, 39 fig, 8 tab, 11 ref.

Descriptors: *Seismic studies, *Bottom sediments, *Mechanical properties, *Viscosity, *Elasticity(Mechanical), *California, Particle size, Sediment sorting, Sands, Silts, Clays, Porosity, Density, Sedimentology, Sonor, Sounding, Sound waves.
Identifiers: Monterey Bay(Calif).

The viscoelastic properties of 13 marine samples collected by Shipek grab from shallow water regions of Monterey Bay, California were measured using a torsionally oscillating cylindrical probe operating in the frequency range of 0.8 to 3.3 kHz. Other mass physical properties such as wet density, porosity, sound speed, sand-silt-clay-gravel percentages, mean grain size and sorting were also measured. Limited precision of impedance measurements permitted only the determination of the mechanical resistance due to the probe contact with the sediment. Correlations between mechanical resistance and mass physical properties were studied by graphical means. Water content of sediments is a determining factor in the mechanical resistance of a sediment. A dependence of mechanical resistance upon frequency was observed. (Knapp-USGS)
W75-00223

CHEMICAL WEATHERING, SOIL DEVELOPMENT, AND GEOCHEMICAL FRACTIONATION IN A PART OF THE WHITE MOUNTAINS, MONO AND INYO COUNTIES, CALIFORNIA,
Geological Survey, Washington, D.C.
D. E. Marchand.
Available from GPO, Washington, DC 20402, Price $1.35 paper cover. Professional Paper 352-J, p 379-424, 1974. 46 p, 47 fig, 29 tab, 75 ref.

Descriptors: *Weathering, *Soil formation, *Erosion, *Mountains, *California, Water chemistry, Geology, Vegetation effects, Climates, Mineralogy.
Identifiers: *White Mountains(Calif).

Weathering of diverse lithologies under a reasonably uniform semiarid subalpine environment was studied in the White Mountains, California. The local vegetation, consisting primarily of sagebrush, bristlecone and limber pine, and associated perennial herbs, is relatively sparse and shows marked discontinuities across geologic contacts. Solis in the region are immature lithosols, usually less than 1 foot deep. Rock weathering in this region appears to be primarily a function of mineral composition and of rock flaws which serve as avenues for penetrating fluids. Physical breakdown, which tends to precede chemical weathering, seems as closely related to lithologic features as to climate. Since erosion is aided by rapid weathering, easily disintegrated rock types such as coarse-grained carbonate and adamellite and fissile shale have eroded to topographic lows while slow-weathering fine-grained carbonate, quartzose sandstone, basalt, aplitic dikes, and mafic inclusions have resisted erosion. Authigenic calcite is apparently precipitated in the soil during dry seasons and partially dissolved during wet periods. Dolomite soil water extracts appear closer in pH to the spring waters than to rain or snow. Chemical changes in both solid and liquid phases related to the dolomite appear to begin along with physical breakdown in the early stages of rock weathering. Chemical equilibrium does not exist in the natural waters studied, but steady-state conditions are closely approximated in spring waters. (Knapp-USGS)
W75-00230

RHYTHMIC PATTERNS OF BEACH TOPOGRAPHY,
Louisiana State Univ., Baton Rouge. Coastal Studies Inst.
J. L. Van Beek.
Available from NTIS, Springfield, Va 22161 as AD-776 593, Price $3.75 printed copy; $2.25 microfiche. Report No 157, March 1974. 46 p, 23 fig, 34 ref. ONR Contract N00014-69-A-0211-0003.

Descriptors: *Beaches, *Geomorphology, *Beach erosion, *Sedimentation, Topography, Waves(Water), Littoral drift, Sand waves, Sediment transport, Sand bars, Surf.
Identifiers: Beach cusps.

Many beaches feature a rhythmic pattern of topographic variation. The pattern may be apparent simultaneously in a longshore alternation of cuspate projections and arcuate embayments along the beach face, in a rhythmic longshore bar composed of an alternate series of arcs and cusps, and in longshore undulation of the nearshore bed. Theoretical considerations and laboratory experiments suggest that this pattern is governed by drift interacting with standing edge waves in the nearshore zone. The relative magnitude and distribution of deposition and erosion involved in bar formation correspond to those expected on the basis of distribution and relative magnitude of predicted drift velocities. Rhythmic bar topography is related primarily to wave height, angle of wave incidence, tide phase, and nearshore circulation. A nearshore circulation system is composed of discrete cells produced as a result of interaction between incident waves and rhythmic bar topography. Expansion of the cusps and intensity of the circulation are mutually supportive and are both enhanced by successive decreases of low-tide water depths following neap tide. Expansion of the cusps and increasing intensity of the circulation produce a topography that tends increasingly toward longshore alternation of elongate shoals and well-defined channels. Rhythmic topography appears to attenuate when interaction between the bar and incident waves diminishes as a result of increasing low-tide water depths or decreasing wave heights; the cellular circulation pattern disappears, and coalescence of the shoals with the beach face is enhanced. (Knapp-USGS)
W75-00239

SPATIALLY VARIED SUBCRITICAL AND SUPERCRITICAL FLOW IN GULLIES,
Kentucky Univ., Lexington. Water Resources Research Inst.
T. Y. Kao.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 788, $5.25 in paper copy, $2.25 in microfiche. Research Report No 74, August 1974. 100 p, 23 fig, 14 tab, 16 ref, 3 append. OWRT A-037-KY(2). 14-31-0001-3517. 14-31-0001-3817.

Descriptors: *Open channel flow, *Transition flow, *Subcritical flow, *Supercritical flow, *Standing waves, Gullies, *Gully erosion.
Identifiers: Gullies flow, *Spatially varied flow, Method of characteristics.

The objective was to investigate the phenomena of subcritical and supercritical spatially varied flow in rectangular expansions such as that in an erosion gully. Based on momentum and continuity principles, equations were developed to predict such flow phenomena. Computations of the water surface profiles for subcritical spatially varied flow were carried out by applying direct step numerical calculations. Because of the presence of standing waves, the method of characteristics was employed in the analytical analysis of the supercritical flow phenomena. Of primary importance is the effect of varying amounts of lateral inflow rates. Other parameters varied during the experimental tests were the slope of the channel and the main channel discharge. Comparison of the analytical and experimental results indicated that

for both subcritical and supercritical spatially varied flow, water surface profiles can be predicted with good accuracy. (Grieves-Kentucky)
W75-00269

EXPERIMENTAL STUDY OF THE EFFECT OF SALTATION LOAD ON FLOW KINEMATICS,
Akademiya Nauk SSSR, Moscow. Institut Vodnykh Problem.
S. K. Olivinskaya, A. A. Pivovarov, and K. I. Rossinskiy.
Soviet Hydrology, Selected Papers No. 2, p 163-168, 1973. 5 fig, 1 tab, 9 ref. Translated from Water Resources (Vodnyye resursy), No. 2, p 111-117, 1973.

Descriptors: *Saltation, Hydraulics, *Turbulence, *Sediment transport, Bed load, Currents(Water), *Open channel flow, Distribution patterns, Tracers.
Identifiers: *USSR, Laboratory investigations, Pulsation velocity, Velocity distribution.

The movement of ridges with particles 3 to 7 mm in diameter and a fall velocity of 26-30 cm/sec on a model with a stabilized rough bottom made of gravel of the same particle size was investigated. The velocity field of flow was photographed on moving film using neutrally buoyant polystyrene foam tracer particles 2.0-2.5 mm in diameter. The saltation load had a weak effect on the kinematics of flow. An increase in the concentration of the saltation load in the flow led to a decrease in the local average flow velocity at all depths. A decrease in the average flow velocity in the presence of sediment did not distort the logarithmic velocity profile in the flow at least above the layer of the moving load. As the concentration of solid particles increased in the flow so did its turbulence. The increase in turbulence was affected in the same direction both by an increase in the velocity of pulsations, and a decrease in the average flow velocity of pulsations and in average flow velocity. The presence of load in the flow resulted in an increase of bottom roughness, and this increased roughness caused an increase in turbulence. (Humphreys-ISWS)
W75-00314

OXYGEN IN THE MARINE HYGROPSAMMAL AND THE VERTICAL MICRODISTRIBUTION OF OLIGOCHAETES,
Hamburg Univ. (West Germany). Museum of Zoology.
O. Giere.
Mar Biol (Berl), Vol 21, No 3, p 180-189, 1973, Illus.

Descriptors: *Sediments, Chemical analysis, *Oxygen, Sands, Europe.
Identifiers: Germany, *Oligochaetes, United-Kingdom(Scotland), Hygropsammal sediments.

Previous investigations have shown that the inhomogeneous microdistribution of oligochaetes in moist supralittoral sandy shores, the main biotope of marine oligochaetes, often corresponds to the O2 conditions of the sediment. In vertical sample series from German and Scottish (United Kingdom) coasts, due to lack of water, O2 was recorded as O2-diffusion rate (ODR) and redox potential (RP) by insertion of thin electrodes into the different sediment layers. Although these field methods yielded results of limited accuracy (mainly due to the interference of various environmental factors), the relevance of electrometrical measurements for analyses of the distributional ecology of oligochaetes was proved: based on different principles, the combination of ODR- and RP-measurements yields reliable information on the O2 conditions in hygropsammal sediments. In many cases, the oligochaete distribution, especially the marked vertical decrease in population density, follows the ODR- and RP-curves. However, in well oxygenated sediments, often the influence of other ecofactors (e.g. food supply) on the distributional pattern is also evident.--Copyright 1974, Biological Abstracts, Inc.
W75-00326

LATERAL EROSION AND OVERBANK DEPOSITION ON THE MISSISSIPPI RIVER IN LOUISIANA CAUSED BY 1973 FLOODING,
Louisiana State Univ., Baton Rouge. Dept. of Geography and Anthropology.
R. H. Kesel, K. C. Dunne, R. C. McDonald, K. R. Allison, and B. E. Spicer.
Geology, Vol 2, No 9, p 461-464, September 1974. 4 fig, 1 tab, 10 ref.

Descriptors: *Mississippi River, *Sedimentation, *Louisiana, *Erosion, *Particle size, Silts, Clays, Floods, Meanders.
Identifiers: *Overbank deposition, *Bluff erosion, *Pleistocene bluffland, Backswamp, Point bar, Alluvial valley.

The Mississippi River was out of its banks for more than 2 months from April to June, 1973. The thickness and the texture of overbank sediments were determined for a number of depositional environments on the Mississippi River flood plain in Louisiana. Average sediment thickness ranged from 53 cm along the natural levee to 1.1 cm in the backswamp. The texture of deposits varied from natural levee sediments with 68% sand to backswamp with 97% silt and clay. The amount of lateral erosion of bordering Pleistocene bluffs increased 271% over the previous 9 years of record due to the flood. Using the rate of backswamp deposition during the 1973 flood, it was suggested that backswamp deposits in this area required 10,000 to 11,000 years to accumulate. However, the effects of artificial river regulations on sedimentation rates remains an unknown and was not considered in the analysis. (Bhowmik-ISWS)
W75-00331

THE DISTRIBUTION AND NATURE OF AMINO ACIDS AND OTHER NITROGEN-CONTAINING COMPOUNDS IN LAKE ONTARIO SURFACE SEDIMENTS,
Canada Centre for Inland Water, Burlington (Ontario).
For primary bibliographic entry see Field 5B.
W75-00343

ANAEROBIC METABOLISM IN LAKE WASHINGTON SEDIMENTS,
Auburn Univ., Ala. Dept. of Fisheries.
For primary bibliographic entry see Field 5C.
W75-00344

AERIAL PHOTOGRAPHIC STUDY OF SHORELINE EROSION AND DEPOSITION, PAMLICO SOUND, NORTH CAROLINA,
North Carolina Univ., Chapel Hill. Dept. of Geology.
G. L. Stirewait, and R. L. Ingram.
North Carolina University Sea Grant Publication UNC-SG-74-09, May 1974. 66 p, 47 fig, 1 tab, 4 ref. 04-3-158-40.

Descriptors: *Erosion, *Deposition, *Shores, *Barrier islands, Sedimentation, Beach erosion, *North Carolina.
Identifiers: Shoreline erosion, Aerial photography, Pamlico Sound(NC), Sea Grant Program.

Recent changes in the shoreline morphology of Pamlico Sound, North Carolina, were determine by examining aerial photographs of varying dates between 1938 and 1971 at 16 sites. At all of the sites except one, shoreline retreat was dominant over shoreline advance. Only at Salvo, on both the ocean and sound side of the barrier island, was shoreline accretion dominant over shoreline retreat. Along the mainland side of the sound the portion of the shoreline showing net erosion averaged approximately 15%; the remaining showed net deposition. Erosion rates varied up to 5 feet per year along semi-protected areas and up to 10 feet per year along exposed headlands. Along the barrier islands side of the sound approximately 75% of the shorelines were retreating at maximum rates of about 8 feet per year. The remaining 25% of the shorelines were accreting sediments. Along the ocean side of the barrier island about 95% of the shorelines were retreating at rates up to approximately 15 feet per year. Only about 5% of the shorelines were advancing. (NOAA)
W75-00379

ST. LUCIE INLET GLOSSARY OF INLETS REPORT NO 1,
State Univ. System of Florida Sea Grant Program, Gainesville.
For primary bibliographic entry see Field 2L.
W75-00390

FORT PIERCE INLET GLOSSARY OF INLETS REPORT NO 2,
State Univ. System of Florida Sea Grant Program, Gainesville.
For primary bibliographic entry see Field 2L.
W75-00391

TSUNAMI PROPAGATION AND RESPONSE TO COASTAL AREAS,
Hawaii Inst. of Geophysics, Honolulu.
M. H. T. Chen.
Report HIG-73-15, NOAA-JTRE-95, December 1973. 83 p, 24 fig, 6 tab, 21 ref.

Descriptors: *Tsunamis, *Earthquakes, Coasts, Shores, Islands, Ocean waves, Hawaii, California.
Identifiers: Alaska earthquake 1964, Acoustic radiation, Boundary conditions, Numerical models, Wave action, Shoaling, Wave amplitudes.

A suitable boundary condition equivalent to the matched impedance boundary condition in acoustic radiation is adapted to describe the open sea boundary where the wave is assumed to be totally transmitted. A numerical model is first used to solve the time-harmonic steady-state problem such as a periodic long wave impinging upon a circular island with uniform water depth. Good agreement is found between the predicted and analytic solutions of the wave amplitude at the shoreline of the island. The destructive tsunami that resulted from the 1964 Alaska earthquake is simulated by a numerical code in spherical coordinates. In general, the predicted first arrival time is approximately 30 minutes earlier than the recorded values. This discrepancy is due to the treatment for the shoaling area, which becomes critical when the spatial grid is 1 by 1 degree for the model. The wave build-up at Crescent City and Hilo was due to local amplification and each should be examined separately. The predicted behavior for the selected station tends to agree with the recorded results. (NOAA)
W75-00480

RELICT SEDIMENT DEPOSITS IN A MAJOR TRANSGRESSIVE COASTAL SYSTEM,
East Carolina Univ., Greenville, N.C. Dept. of Geology.
For primary bibliographic entry see Field 2L.
W75-00488

BOTTOM DRIFT DUE TO PERIODIC WAVES,
Hawaii Inst. of Geophysics, Honolulu.
E. R. Spielvogel, and L. Q. Spielvogel.
Report HIG-73-19, NOAA-JTRE-66, December 1973. 12 p, 2 fig, 3 ref.

Descriptors: *Sediment transport, *Shallow water, *Ocean waves.
Identifiers: *Periodic waves, *Solitary waves, Surface waves.

An analysis is presented as a method of predicting the transport of bottom particles such as sand, silt, and neutrally buoyant particles due to finite-amplitude shallow water waves. The nonlinear shallow water theory is used, retaining second order terms. There is a prediction of the transport of neutrally buoyant particles suspended in a fluid under the influence of periodic nonlinear surface waves. A comparison is made to existing theory which uses solitary waves or parts of solitary waves for the surface shape. (NOAA)
W75-00489

HAWAIIAN BEACHES,
Hawaii Univ., Honolulu. Dept. of Ocean Engineering.
F. Gerritsen.
Proceedings of 13th Conference on Coastal Engineering held Vancouver, B.C. July 10-14, 1972, ASCE, Chap 67, p 1257-1276, 1972. 13 fig, 9 ref.

Descriptors: *Hawaii, *Beach erosion, *Rip currents, *Littoral drift, *Sediment transport, Beaches, Aerial photography, Tidal effects, Waves(Water).
Identifiers: Tidal currents, Littoral cell, Waikiki Beach(Hawaii), Wave climate, Longshore currents, Sea Grant Program.

Hawaii's beaches are of great economical and social value; they serve a variety of purposes and are valuable both to residents and tourists alike. The present study undertaken at the University of Hawaii to obtain detailed insight into the processes at work will be useful in guiding future planning and development for Hawaiian beaches. The study at Waikiki Beach has provided a better insight into the mechanics of water and sediment motion in this area: It has shown that tidal currents, littoral current and rip currents contribute to the sediment motion and the formation of the littoral cell. It has provided insight into the behavior and direction of the littoral drift and has given further evidence to the supposition that the Halekulani channel does not function as a drain, but rather could have a net transport in shoreward direction. A main rip current was found to exist off the Royal Hawaiian Hotel at Waikiki, by which relatively large amounts of material are moved in offshore direction. In the study of beach processes at Waikiki, the use of aerial photography has been of great value. (NOAA)
W75-00498

SEDIMENTATION OFF THE KEWAUNEE NUCLEAR POWER PLANT,
Wisconsin Univ., Green Bay. Coll. of Environmental Sciences.
For primary bibliographic entry see Field 5C.
W75-00499

PATTERNS OF WATER FLOW AND SEDIMENT DISPERSION ADJACENT TO AN ERODING BARRIER ISLAND,
Georgia Marine Science Center, Savannah.
G. F. Oertel.
Georgia Sea Grant Program Technical Report Series No 73-9, January 1974. 37 p, 19 fig, 2 tab, 9 ref.

Descriptors: *Hydrography, *Sediment transport, *Georgia, Tides.
Identifiers: *Tidal currents, *Water flow, Residual currents, Tybee Island(Ga).

A study of hydrography and sediment transport adjacent to Tybee Island, Georgia illustrated the role of tidal currents and residual currents in producing sediment transport patterns. Adjacent to Tybee Island, onshore currents associated with the flooding tide appear to be important mechanisms of sediment transport toward the Savannah River entrance. In most cases the residual flow of water determines the net flow of sand, however, some inconsistencies were present adjacent to Tybee Island. At two stations, there was a net flow of water in one direction and a potential net transport of sediment in the opposite direction. (See also W75-00504) (NOAA)
W75-00503

PATTERNS OF SEDIMENT DISPERSION ON THE SHORELINE OF AN ERODING BARRIER ISLAND,
Georgia Marine Science Center, Savannah.
G. F. Oertel.
Georgia Sea Grant Program, Technical Report Series No 74-2, January 1974. 90 p, 11 fig, 3 ref, 56 charts, 1 append.

Descriptors: *Sediment transport, *Beach erosion, *Barrier islands, *Georgia, Seasonal, Coasts, Beaches, Erosion, Aggradation.
Identifiers: *Beach profiles, *Seasonal variations, Tybee Island(Ga).

A study of the sediment budget of the shoreline at Tybee Island illustrated some relationships between sediment transport patterns and patterns of erosion. Sediment eroded from the northeast portion of the Tybee shoreline accumulated at the beach adjacent to Ninth Street and at the beach along the northwest portion of the island. Most of the shoreline responded to seasonal changes in energy conditions. During the fall and winter the beaches lost sand. During the spring and summer, the beaches gained sand. Between Third Street and Fourteenth Street, the sediment losses during the fall and winter were generally completely compensated for during the spring and summer recovery period. North of Third Street and South of Fourteenth Street, the sediment recovered during the spring and summer was insufficient to balance the losses of the previous fall and winter. (See also W75-00503) (NOAA)
W75-00504

FIELD STUDY OF AN UNCONFINED SPOIL DISPOSAL AREA OF THE GULF INTRACOASTAL WATERWAY IN GALVESTON BAY, TEXAS,
Texas A and M Univ., College Station. Coastal and Ocean Engineering Div.
For primary bibliographic entry see Field 5E.
W75-00506

MATHEMATICAL MODELS OF THE MASSACHUSETTS BAY. PART III. A MATHEMATICAL MODEL FOR THE DISPERSION OF SUSPENDED SEDIMENTS IN COASTAL WATERS,
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
G. C. Christodoulou, W. F. Leimkuhler, and A. T. Ippen.
Sea Grant Report No MITSG-74-114, Index No 74-314 Cbs, January 1974. 145 p, 23 fig, 9 tab, 33 ref, 3 append.

Descriptors: *Coasts, *Dispersion, *Settling velocities, *Sedimentation, *Mathematical models, Dredging, Model studies, Tidal effects, Littoral drift, Flocculation, Spoil banks, Massachusetts.
Identifiers: *Suspended sediments, Wave action, *Massachusetts Bay.

The model basically predicts the quasi-steady state sediment concentration as a function of space and tidal time and the deposition pattern in the region surrounding a continuous vertical line source. It requires that the sediment settling velocities and the hydrodynamic features of the area, the net drift and the tidal velocities as well as the dispersion coefficients be known. Effects of wave action and vertical stratification are not explicitly considered. A separation of variables technique permits a rather independent treatment of the vertical and horizontal distributions; they are linked primarily through the decay factor, which represents the loss of material to the bottom. The model is applied to a hypothetical dredging situation in Massachusetts Bay. The model results indicated very long and relatively narrow dispersion patterns, under the assumption of constant drift direction. The net drift and the sediment settling velocity seem to be the most important factors controlling the dispersion of fines in coastal waters. (NOAA)
W75-00513

2K. Chemical Processes

THE DETERMINATION OF RESIDUAL CHLORINE IN WATERS (LA DETERMINAZIONE DEL CLORO RESIDUO NELLE ACQUE),
For primary bibliographic entry see Field 5A.
W75-00159

WATER CHARACTERISTICS,
Maine Univ., Orono.
For primary bibliographic entry see Field 5A.
W75-00197

CHEMICAL WEATHERING, SOIL DEVELOPMENT, AND GEOCHEMICAL FRACTIONATION IN A PART OF THE WHITE MOUNTAINS, MONO AND INYO COUNTIES, CALIFORNIA,
Geological Survey, Washington, D.C.
For primary bibliographic entry see Field 2J.
W75-00230

THE WATERS OF HOT SPRINGS NATIONAL PARK, ARKANSAS--THEIR ORIGIN, NATURE, AND MANAGEMENT,
Geological Survey, Little Rock, Ark.
For primary bibliographic entry see Field 2F.
W75-00231

QUANTITY AND CHEMICAL QUALITY OF LOW FLOW IN THE FRIO RIVER, TEXAS, DECEMBER 18-21, 1967,
Geological Survey, Austin, Tex.
H. L. Kunze, and P. B. Rohne, Jr.
Open-file report, 1974. 11 p, 2 fig, 2 tab, 4 ref.

Descriptors: *Water quality, *Low flow, *Rivers, *Texas, Basic data collections, Dissolved solids, Hydrologic data, Discharge(Water).
Identifiers: *Frio River(Tex).

During a study of quality of water during December 18-21, 1967, water discharge in the Frio River, Texas, increased from 10.7 cfs at Fowlerton to 54.6 cfs at the mouth, 62.9 miles downstream. Four significant gains and one significant loss were measured between individual sites. There was no rainfall during the period of this investigation. The quality of water improved slightly in the first 8 miles of the study reach, then deteriorated progressively downstream as a result of tributary inflow which contained higher dissolved-solids concentrations than the Frio River. The dissolved solids increased from 599 mg/liter at site 1 to 1,110 mg/liter at site 12. The chloride concentration increased from 190 mg/liter to 312 mg/liter from site 1 to site 12. (Knapp-USGS)
W75-00237

KAOLINITE SYNTHESIS AT 25 DEG C,
Geological Survey, Menlo Park, Calif.
J. D. Hem, and C. J. Lind.
Science, Vol 184, No 4142, p 1171-1173, June 14, 1974. 1 fig, 12 ref.

Descriptors: *Clay minerals, *Organic compounds, *Synthesis, *Kaolinite, Crystal growth, Chemical reactions, Water chemistry, Weathering, Soil formation, Organic matter, Chelation.
Identifiers: *Quercitin.

The addition of quercetin, an organic flavone, to aqueous solutions containing silica and aluminum and adjusted to final pH's from 6.5 to 8.5 produced a 1:1 aluminosilicate precipitate which, after 6 to 16 months of aging in solution at 25 deg C, contained as much as 5 percent well-formed kaolinite plates. Similar solutions containing no organic material produced relatively amorphous precipitates with the same composition and stability (standard free energy of formation= minus 897 plus or minus 1 kilocalories per mole) but with substantially smaller amounts of crystalline material even after 2 years of aging. The principal effect of the organic constituent here was probably to slow the polymerization of polynuclear aluminum hydroxide species, in the pH range 6.5 to 8.5 where the polymerization normally is very rapid. This permitted more reactants to follow the slow reaction path leading to kaolinite that is better crystallized. In addition to its effects on the kinetic factors, the aluminum-quercetin complex that forms may facilitate the development of A1-0-Si bonding, because it contains A1-0 bonds. (Knapp-USGS)
W75-00248

TOTAL DISSOLVED SOLIDS IN GROUND WATER OF THE WAINWRIGHT AREA, ALBERTA,
Research Council of Alberta, Edmonton.
For primary bibliographic entry see Field 5B.
W75-00321

SEASONAL VARIATIONS AND DISTRIBUTION OF DISSOLVED IRON IN AN AQUIFER,
Geological Survey of Sweden, Stockholm.
For primary bibliographic entry see Field 5B.
W75-00336

THE THERMAL SPRINGS OF BAKRESWAR, INDIA: PHYSICOCHEMICAL CONDITIONS, FLORA AND FAUNA,
Visva-Bharati Univ., Santiniketan (India). Dept. of Zoology.
B. B. Jana.
Hydrobiologia. Vol 41, No 3, p 291-307. 1973.

Descriptors: *Thermal springs, Water temperature, Water chemistry.
Identifiers: *India(Bakreswar).

A compendium pertaining to the origin, geology and morphometry of these West Bengal springs (1 cold and 7 thermal) is incorporated in brief. The temperature of the thermal springs remained almost constant over the past 2 decades, and the location of the fissures of the springs is unchanged. On the basis of temperature these thermal springs are grouped into 'acrothermal' and 'euthermal.' The water of all the springs was alkaline with a Ph between 7.4 and 9.2. No carbon dioxide was detected during the period of study. Absence of nitrite and traces of nitrate are characteristic features of these springs. The variation of color of the water may be related to the presence of algal mats at the bottom of the springs. The quantity of plankton was maximal and minimal in thermal springs having highest and lowest temperature respectively. Oscillatoria sp., Navicula sp., Cyclotella sp. and Tetraedron sp. were noted at temperatures between 26C and 51C. It is a new record from India that diatoms like Navicula sp. and Cyclotella sp. can survive in the temperature range of 43-51C. The thermophilic nematode, Tobrilus sp., Cyclops sp., nauplius larvae, and Lecane sp. were recorded from Swetaganga with a maximum temperature of 44C. The mechanism of thermophily of the organisms is discussed in brief.--Copyright 1974, Biological Abstracts, Inc.
W75-00356

AUTOMATIC DETERMINATION OF AMMONIA AND AMINO-ACID NITROGEN IN MARINE AND BRACKISH WATERS, (IN ITALIAN),
Istituto di Biologia del Mare, Venice (Italy).
F. Cioce, F. Dolci, G. Stocco, and R. Toniolo.
Arch Oceanogr Limnol, Vol 17, No 3, p 297-302, 1972, Illus, English summary.

Descriptors: *Chemical analysis, *Analytical methods, Salinity, *Instrumentation, Ammonia, Brackish water, Sea water, Pollutant identification, Automation.
Identifiers: Technicon analyzer.

A modification for marine, brackish and fresh waters of the automated method of determination of ammonia plus amino-acid N by oxidation with alkaline hypochlorite and potassium bromide as catalyst is described. The technique is an adaptation to the highly variable salinity and ammonia concentration in Northern Adriatic waters; an automatic apparatus made with components of the 'Technicon Autoanalyzer' is used.--Copyright 1974, Biological Abstracts, Inc.
W75-00387

2L. Estuaries

RISK EVALUATION OF TIDAL-INFLUENCED FLOOD CONTROL RESERVOIR,
Technical Univ. of Denmark, Lyngby. Inst. of Hydrodynamics and Hydraulic Engineering.
For primary bibliographic entry see Field 4A.
W75-00096

SHORELINES MANAGEMENT: THE WASHINGTON EXPERIENCE.
For primary bibliographic entry see Field 6B.
W75-00105

WHY IT MAY COST 100 MILLION (POUNDS) TO CLEAN UP MERSEY SHORES,
For primary bibliographic entry see Field 5G.
W75-00110

GROUP CONSIDERS PROPER MANAGEMENT OF COASTAL AREAS.
For primary bibliographic entry see Field 6B.
W75-00113

CERIOPS TAGAL (PERR.) C. B. ROBINSON AT KOSI BAY,
University of Durban-Westville (South Africa). Dept. of Botany.
T. D. Steinke, and C. J. Ward.
J S Afr Bot. Vol 39, No 3, p 245-247, 1973. Illus.

Descriptors: Bays, Estuaries, *Trees, Africa.
Identifiers: *South Africa(Koski Bay), Ceriops-Tagal.

A survey at Kosi Bay revealed that saplings of C. tagal were common in the estuary, although no living mature trees were found. While prospects for the continued existence of this community are good, there still remains a strong need for protection of this species which has been recorded from no other locality in the Republic of South Africa.--Copyright 1974, Biological Abstracts, Inc.
W75-00184

LONG-TERM VARIABILITY IN THE STRUCTURE OF SUBTIDAL BENTHIC COMMUNITIES IN PUDGET SOUND, WASHINGTON, USA,
U. Lie, and R. A. Evans.
Mar Biol (Berl), Vol 21, No 2, p 122-126, 1973, Illus.

Descriptors: Benthos, *Benthic fauna, Aquatic life, *Washington, *Aquatic populations, *Pollutant identification.
Identifiers: *Puget Sound(Wash).

Data on benthic infauna from 4 permanent stations in Puget Sound off Seattle, Wash., collected during 1963-1964, 1967 and 1969, revealed considerable stability in numbers of species and specimens and in diversity within stations among sampling dates. The species composition of the faunal assemblages also remained rather constant during the period of investigation, but the relative dominance among the numerically important species varied. Biomass data did not differ significantly in 1964 and 1969, but the 1967 data were considerably lower at all stations--Copyright 1974, Biological Abstracts, Inc.
W75-00195

RHYTHMIC PATTERNS OF BEACH TOPOGRAPHY,
Louisiana State Univ., Baton Rouge. Coastal Studies Inst.
For primary bibliographic entry see Field 2J.
W75-00239

SALINITY PROBLEMS OF ORGANISMS IN COASTAL AREAS SUBJECT TO THE EFFECT OF ENGINEERING WORKS,
Gulf Coast Research Lab., Ocean Springs, Miss.
For primary bibliographic entry see Field 5C.
W75-00240

NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY,
Environmental Protection Agency, Annapolis, Md. Annapolis Field Office.
For primary bibliographic entry see Field 5B.
W75-00243

THE PROTOZOA OF MOBILE BAY, ALABAMA,
University of South Alabama, Mobile.
For primary bibliographic entry see Field 5C.
W75-00262

PREDICTING POLLUTION IN THE JAMES RIVER ESTUARY: A STOCHASTIC MODEL,
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Statistics.
For primary bibliographic entry see Field 5B.
W75-00273

POPULATION SIZE AND MORTALITY OF JUVENILES OF THE MARINE TELEOST RHABDOSARGUS HOLUBI (PISCES: SPARIDAE) IN A CLOSED ESTUARY,
Rhodes Univ., Grahamstown(South Africa). Dept. of Zoology.
S. J. M. Blaber.
Mar Biol (Berl), Vol 21, No 3, p 219-225, 1973, Illus.

Descriptors: *Estuaries, *Africa, Fishkill, Juvenile fish, *Fish populations, Mortality, Fish, *Teleosts, Aquatic animals.
Identifiers: Rhabdosargus-holubi, Pisces, Sparidae.

The populations of juvenile Rhabdosargus holubi present in a south-east African estuary which was closed off from the sea in 1971 and 1972 were estimated using mark-recapture techniques. The estuary opened to the sea in Aug., 1971, and did not close again until Jan., 1972, by which time a different population of R. holubi had established itself. The Petersen method and a multiple mark-recapture method gave comparable population estimates. Catch/unit effort data supported the trends shown by the population estimates. At the beginning of 1971, the population was about 55,000 but, at the end of 7 mo., had declined to 11,000, the monthly mortality varying between 9 and 49%. Mortality was insignificant in 1972, when a different population of approximately 12,000 in-

dividuals was present. The decline in numbers in 1971 was possibly due to bird predation and was density-dependent.--Copyright 1974, Biological Abstracts, Inc.
W75-00328

OCEANOGRAPHY OF NORTHERN ADRIATIC SEA: 2. HYDROLOGIC FEATURES: CRUISES JANUARY-FEBRUARY AND APRIL-MAY 1966,
Istituto di Biologia del Mare, Venice (Italy).
P. Franco.
Arch Oceanogr Limnol. 17(Suppl), p 1-97. 1972. Illus.

Descriptors: *Adriatic Sea, Hydrology, Primary production.
Identifiers: *Italy(Po River).

The 3rd and 4th seasonal cruises of an annual series were carried out during winter and spring 1966 in the northern Adriatic Sea, in order to study the influence of the Po River (Italy) outflow on the circulation and distribution of the oceanographic properties related to primary production in this basin. Hydrological and meteorological data are reported. The circulation pattern seems to be regulated chiefly by the interrelationships between the thermic structure of the basin and the Po River discharge rate. During the period of most severe winter cooling the water column was practically isothermal and unstable. A consequence of this was the formation in the north-western basin of a very dense water body and the isolation of the river-diluted waters in a narrow southward current flowing along the western coast. The spring heating developed a thermic vertical gradient, stabilizing the water column. A circulation pattern like those in summer and autumn was restored. The stratified structure led to the formation of a cyclonic eddy in the northern basin and to the spreading of the diluted waters in the surface layers.--Copyright 1974, Biological Abstracts, Inc.
W75-00359

ACCUMULATION AND MOVEMENT OF MIREX IN SELECTED ESTUARIES OF SOUTH CAROLINA, 1969-71,
Environmental Protection Agency, Gulf Breeze, Fla. Gulf Breeze Environmental Research Lab.
For primary bibliographic entry see Field 5B.
W75-00360

MARYLAND SHAPES HER RICHEST MARSHES.
For primary bibliographic entry see Field 6E.
W75-00371

ATLAS OF PHYSICAL AND CHEMICAL PROPERTIES OF PUGET SOUND AND ITS APPROACHES,
Washington, Univ., Seattle. Dept. of Oceanography.
E. E. Collias, Noel McGary, and Clifford A. Barnes.
Washington Sea Grant Program WSG 74-1, 1974. 1 fig, 9 ref. SG NG-1-72, 04-3-158-42, N8onr-520/111, Nonr-477(01)etc.

Descriptors: *Physical properties, *Chemical properties, *Estuaries, *Coasts, Water chemistry, Charts, Sounds, *Washington.
Identifiers: *Water characteristics, *Oceanographic data, *Oceanographic charts, *Puget Sound(Wa), Sea Grant Program.

This atlas makes a graphic presentation of the physical and chemical oceanographic data from Puget Sound and its approaches and provides a convenient and usable reference for defining the major features of water properties in Puget Sound. Water properties along eight longitudinal profiles are presented for varying time intervals over a span of 14 years: from 1952 through 1966. The major features of the distribution of properties can be followed as they change in space and time. Values for different years at corresponding seasons can be compared to give an insight into the year-to-year variations. Measurements were made along the major axes of the various channels and represent locally the background salino waters that feed the peripheral areas. (NOAA)
W75-00375

NUMERICAL PROPERTIES OF IMPLICIT FOUR-POINT FINITE DIFFERENCE EQUATIONS OF UNSTEADY FLOW,
Weather Bureau, Washington, D.C. Office of Hydrology.
For primary bibliographic entry see Field 2E.
W75-00380

APPLYING A WATER QUALITY MODEL TO POLLUTION MANAGEMENT: D.O.--B.O.D. IN NARRAGANSETT BAY,
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
For primary bibliographic entry see Field 5B.
W75-00382

MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART VI. CURRENT MEASUREMENTS IN THE OUTER LOS ANGELES HARBOR,
University of Southern California, Los Angeles. Allan Hancock Foundation.
Kendal S. Robinson, and H. Porath.
Southern California University Sea Grant Program, USC-SG-7-74, July 1974. 94 p, 66 fig, 5 ref, 3 append. USC-SG-7-74.

Descriptors: *Currents(Water), *Water pollution, Circulation, Current meters, Coastal engineering, Harbors, Bays, Coasts, *California.
Identifiers: San Pedro(CA), *Los Angeles Harbor(CA), Current measurements, *Surface currents, *Coastal waters, Sea grant program.

Surface currents in the Los Angeles Harbor were measured by three current meters. The main current producing forces appear to be tide and wind with the resulting current modified by the geometry of the basin. Current speeds were generally 0.1 to 0.2 knots at the surface and were more variable at stations near the outer breakwater than at stations near Terminal Island. A large counter-clockwise gyre was found during one period of observation, followed by a period of divergence in the same area one week later. (NOAA)
W75-00384

RESOURCE EVALUATION STUDIES ON THE MATAGORDA BAY AREA, TEXAS,
Texas A and M Univ., College Station.
For primary bibliographic entry see Field 5B.
W75-00386

A SYSTEM FOR THE DETERMINATION OF CHRONIC EFFECTS OF POLLUTANTS ON THE PHYSIOLOGY AND BEHAVIOR OF MARINE ORGANISMS,
Florida State Univ., Tallahassee. Dept. of Biological Science.
For primary bibliographic entry see Field 5C.
W75-00388

MANAGING SHELLFISH RESOURCES UNDER INCREASING POLLUTION LOADS,
New York State Dept. of Environmental Conservation, Albany. Div. of Marine and Coastal Resources.
For primary bibliographic entry see Field 5C.
W75-00389

ST. LUCIE INLET GLOSSARY OF INLETS REPORT NO 1,
State Univ. System of Florida Sea Grant Program, Gainesville.
T. L. Walton.
Florida Sea Grant Program Report Number 2, July 1974. 65 p, 19 fig, 4 tab, 21 ref, 1 append. SG NG-3-72.

Descriptors: *Inlets(Waterways), Tides, Waves(Water), Currents(Water), Storms, Winds, Littoral drift, *Florida.
Identifiers: *Storm tides, *Astronomical tides, Shoreline changes, Sea grant program, St. Lucie(Fla).

This report on St. Lucie Inlet is the first in a 'Glossary of Inlets' series to be prepared under the State University System Sea Grant Project 'Nearshore Circulation, Littoral Drift, and the Sand Budget of Florida'. The purpose of this series is for each inlet to provide a summary of the more significant available information and to list known documentation. Details are given on the history of the inlet, shoreline changes, and the climatology of the St. Lucie area. In particular, information is given on the astronomical tides and currents, storm tides, winds, waves, and littoral drift. (NOAA)
W75-00390

FORT PIERCE INLET GLOSSARY OF INLETS REPORT NO 2,
State Univ. System of Florida Sea Grant Program, Gainesville.
T. L. Walton.
Florida Sea Grant Program Report No 3, July 1974. 53 p, 14 fig, 3 tab, 15 ref, 1 append. 04-3-158-43.

Descriptors: *Inlets(Waterways), Tides, Waves(Water), Currents(Water), Storms, Winds, Littoral drift, Florida.
Identifiers: *Storm tides, *Astronomical tides, Shoreline changes, Sea grant program, Port Pierce(Fla).

This report of Ft. Pierce Inlet is the second in a 'Glossary of Inlets' series to be prepared under the State University System Sea Grant Project 'Nearshore Circulation, Littoral Drift, and the Sand Budget of Florida'. The purpose of this series is for each inlet to provide a summary of the more significant available information and to list known documentation. Details are given on the history of the inlet, shoreline changes, and the climatology of the Fort Pierce area. In particular, information is given on the astronomical tides and currents, storm tides, winds, waves, and littoral drift. (NOAA)
W75-00391

1974 FLOATING BREAKWATERS CONFERENCE PAPERS.
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
For primary bibliographic entry see Field 8B.
W75-00404

ECOLOGICAL STUDIES ON THE JACK MACKEREL, TRACHURUS JAPONICUS (TEMMINCK ET SCHLEGEL: III. AMOUNT OF FOOD CONSUMPTION FOR GROWTH OF YOUNG FISH), (IN JAPANESE),
Japan Sea Regional Fisheries Research Lab., Niigata.
T. Suzuki.
Bull Jap Sea Reg Fish Res Lab, 24, p 67-76, 1973, Illus. English summary.

Descriptors: *Fish food organisms, Bays.
Identifiers: Anchovy, Euphausia, *Japan, Trachurus japonicus, *Mackerel.

The results of feeding experiments of young jack mackerel, T. japonicus, were extrapolated for the estimation of food consumption of the young fish in Sendai Bay and Wakasa Bay, Japan. The foods used in experiments were krill, Euphausia pacifica, and young anchovy. The following estimated values were obtained. The 0-year old fish in Sendai Bay was presumed to grow up from 8.2 g to 25.6 g in weight during the period between July 1 and Sept. 30, and the amount of foods consumed for the above growth was calculated at 116.6 g of Euphausia, amounting to 67.6 cal on the energy basis. The 0-year old fish in Wakasa Bay was presumed to grow up from 3.2 g on July 1 to 13.8 g on Sept. 30, to 22.5 g at the end of the year, and the amount of foods consumed for the growth was calculated at 136.0 g of Euphausia, amounting to 78.9 cal. The 1-yr old fish in Wakasa Bay was presumed to grow up to 24.7 g on March 31, to 39.9 g on July 1, to 68.5 g on Sept. 30 and to 77.6 g at the end of the year, and the amount of foods consumed for the yearly growth was calculated at 626.2 g of the anchovy amounting to 407.1 cal.--Copyright 1974, Biological Abstracts, Inc.
W75-00445

EFFECT OF ZOOPLANKTON GRAZING ON THE FORMATION OF THE ANOXIC LAYER IN TOKYO BAY,
Tokyo Univ., (Japan). Ocean Research Inst.
For primary bibliographic entry see Field 5C.
W75-00448

EFFECTS OF THE INSECTICIDE CARBARYL ON CLAMS AND SOME OTHER INTERTIDAL MUD FLAT ANIMALS,
Oregon State Univ., Newport. Marine Science Center.
For primary bibliographic entry see Field 5C.
W75-00451

OCEAN ENGINEERING AND OCEANOGRAPHY TECHNICAL LITERATURE COLLECTION, WATER RESOURCES CENTER ARCHIVES,
California Univ., Berkeley. Hydraulic Engineering Lab.
For primary bibliographic entry see Field 10D.
W75-00483

EFFECT OF SPOIL DISPOSAL ON BENTHIC COMMUNITIES NEAR THE MOUTH OF DELAWARE BAY,
Delaware Univ., Coll. of Marine Studies.
For primary bibliographic entry see Field 5C.
W75-00484

POTENTIAL BIOLOGICAL EFFECTS OF HYPOTHETICAL OIL DISCHARGES IN THE ATLANTIC COAST AND GULF OF ALASKA,
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
For primary bibliographic entry see Field 5C.
W75-00485

PRIMARY, PHYSICAL IMPACTS OF OFFSHORE PETROLEUM DEVELOPMENTS.
Massachusetts Inst. of Tech., Cambridge. Dept. of Ocean Engineering.
For primary bibliographic entry see Field 5B.
W75-00486

RELICT SEDIMENT DEPOSITS IN A MAJOR TRANSGRESSIVE COASTAL SYSTEM,
East Carolina Univ., Greenville, N.C. Dept. of Geology.
S. R. Riggs, and M. P. O'Connor.
North Carolina University Sea Grant Program, UNC-SG-74-04, January 1974. 41 p, 16 fig, 10 ref.

Descriptors: *Erosion, *Estuaries, Florida, *North Carolina, Continental shelf, Barrier islands, Sedimentology, Coasts, Inlets(Waterways), Gulf of Mexico.
Identifiers: *Relict sediments, *Marine transgressions, Nearshore.

Relict sediments occur both on the continental shelf and within estuaries as a result of intra-estuarine erosion. It is possible that continued transgression of a barrier system could re-expose several types of estuarine sediments on the shelf areas which could produce extremely complex facies relationships. The objectives of this paper are (1) to examine the occurrence, mode of formation, and geometry of the modern and relict sediments within a major estuary and to identify possible sediment characteristics and trends which could be useful in recognizing relict sediments on the shelf, and (2) to consider a possible relict origin for some of the nearshore shelf features exposed seaward of a transgressing barrier system. The conclusions reached in this paper are based upon detailed sediment studies in the barrier island coastal systems of North Carolina and the Gulf Coast area of Central Florida. (NOAA)
W75-00488

BOTTOM DRIFT DUE TO PERIODIC WAVES,
Hawaii Inst. of Geophysics, Honolulu.
For primary bibliographic entry see Field 2J.
W75-00489

SOME FEATURES OF THE DYNAMIC STRUCTURE OF A DEEP ESTUARY,
National Ocean Survey, Rockville, Md. Oceanographic Div.
M. Devine.
NOAA Technical Memorandum NOS 14, April 1974. 21 p, 3 fig, 24 ref, 1 append.

Descriptors: *Estuaries, *Estuarine environment, *Hydrodynamics, Mixing, Stratification, Upwelling, Pollutants, Dispersion, Stratification.
Identifiers: *Halocline, *Flushing, Mass exchange.

A boundary-layer formulation for the dynamic structure of a deep estuary is developed. Cross-stream averages are used, but the boundary-layer structure is shown to depend on the cross-stream geostrophic constraint. A similarity transformation and a weighted residual method are used to derive an approximate solution for the velocity and salinity structure of the upper layer. This solution indicates that, in the central regime of the estuary, outflow extends through the entire halocline. Inflow takes place in a much less stratified lower layer, and mass exchange between the layers is by upwelling. This structure is modified in the outer regime of the estuary where mixing between the layers develops and in the inner regime where a sharp halocline develops and where mass exchange is by entrainment. The implications of the dynamics for the flushing process and for pollutant movement and dispersion are discussed. (NOAA)
W75-00492

THE HYDROGRAPHY OF ELKHORN SLOUGH, A SHALLOW CALIFORNIA COASTAL EMBAYMENT,
Moss Landing Marine Lab., Calif.
R. E. Smith.
Technical Publication 73-2, CASUC-MLML-TP-73-02, 1973. Also as Moss Landing Marine Laboratories Contrib. No. 42, 97 p, 23 fig, 5 tab, 47 ref, 3 append.

Descriptors: *Bottom sediments, *Inlets(Waterways), Coasts, *California, Hydrography, Phosphates, Nitrogen, Salt balance, Freshwater, Dissolved oxygen, Water quality, Diffusion, Primary productivity, Respiration, Tidal effects.
Identifiers: *Diurnal variations, *Seasonal variations, *Tidal cycles, Embayments, Elkhorn Slough(Calif.), Moss Landing Harbor(Calif.).

From October 1970 through February 1972, temperature, salinity, dissolved oxygen, secchi depth and five major nutrients were observed at approximately monthly intervals in Elkhorn Slough and Moss Landing Harbor. In addition, similar hourly observations were made during two tidal studies during the wet and dry seasons. From the salinity measurements during the summer, a salt balance for Elkhorn Slough is formulated and mean eddy diffusion coefficients are determined. Consistent differences, apparently due to differing regeneration rates, were observed in the phosphate and nitrogen distributions. Bottom sediments are proposed as a possible source for phosphate and as a sink for fixed nitrogen. Dairy farms located along central Elkhorn Slough are apparently a source for reduced nitrogen. During summer, nitrogen was found to be the limiting nutrient for primary production in the upper slough. Tidal observations indicated fresh water of high nutrient concentration consistently entered the harbor from fresh water sources to the south. Net production and respiration rates are calculated from diurnal variations in dissolved oxygen levels observed in upper Elkhorn Slough. Changes in phosphate associated with the variations in oxygen was close to the accepted ratio of 1:276 by atoms. (NOAA)
W75-00497

HAWAIIAN BEACHES,
Hawaii Univ., Honolulu. Dept. of Ocean Engineering.
For primary bibliographic entry see Field 2J.
W75-00498

PATTERNS OF WATER FLOW AND SEDIMENT DISPERSION ADJACENT TO AN ERODING BARRIER ISLAND,
Georgia Marine Science Center, Savannah.
For primary bibliographic entry see Field 2J.
W75-00503

PATTERNS OF SEDIMENT DISPERSION ON THE SHORELINE OF AN ERODING BARRIER ISLAND,
Georgia Marine Science Center, Savannah.
For primary bibliographic entry see Field 2J.
W75-00504

FIELD STUDY OF AN UNCONFINED SPOIL DISPOSAL AREA OF THE GULF INTRACOASTAL WATERWAY IN GALVESTON BAY, TEXAS,
Texas A and M Univ., College Station. Coastal and Ocean Engineering Div.
For primary bibliographic entry see Field 5E.
W75-00506

MATHEMATICAL MODELS OF THE MASSACHUSETTS BAY. PART III. A MATHEMATICAL MODEL FOR THE DISPERSION OF SUSPENDED SEDIMENTS IN COASTAL WATERS,
Massachusetts Inst. of Tech., Cambridge. Ralph M. Parsons Lab. for Water Resources and Hydrodynamics.
For primary bibliographic entry see Field 2J.
W75-00513

A NUMERICAL TIDAL MODEL OF NARRAGANSETT BAY,
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
K. W. Hoss, and F. M. White.
Rhode Island University Marine Technical Report No 20, 1974. 148 p, 30 fig, 32 ref, 3 append.

Descriptors: *Estuaries, *Tidal effects, *Water quality, *Mathematical models, *Boundary processes, *Rhode Island, Computer programs, Temperature, Salinity, Models.
Identifiers: *Narragansett Bay, Numerical models, Boundary conditions, Sea Grant Program.

The basic approach of Leendertse (Aspects of a Computational Model for Long-Period Water-Wave Propagation, Rand Corporation, Santa Monica, Calif., Memo. RM5294-PR, May 1967) was chosen for the development of the numerical model of Narragansett Bay, which is a wide, shallow estuarine system dominated by tidal effects. The model has been adapted to the Bay with several modifications. The following is an explanation of the mathematics of the solution as used in the Bay model, along with certain necessary modifications of the original approach. The model was developed to provide information concerning the tidal dynamics of the Bay and the accompanying currents and flowrates. Verification studies have been carried out and reported here, and the model will be used as the basis of a concentration-transport model for the safety of salinity, temperature, and biochemical parameters in the Bay. (NOAA)
W75-00516

3. WATER SUPPLY AUGMENTATION AND CONSERVATION

3A. Saline Water Conversion

NEW HIGH-EFFICIENCY METHODS FOR THE DESALTING OF NATURAL WATERS AND FOR THE PURIFICATION OF WASTEWATERS (NOVYYE VYSOKOEFFEKTIVNYYE METODY OPRESNENIYA PRIRODNYKH I OCHISTKI STOCHNYKH VOD),
For primary bibliographic entry see Field 5D.
W75-00154

3B. Water Yield Improvement

FIELD EVALUATION OF AN ELECTROGASDYNAMIC FOG DISPERSAL CONCEPT,
Gourdine Systems, Inc., Livingston, N.J.
T. -K. Chiang, T. Wright, and R. Clark.
Available from NTIS, Springfield, Va 22161 as AD-763 550, Price $4.25 printed copy; $2.25 microfiche. Federal Aviation Administration Report No FAA-RD-73-33, February 1973. 52 p, 22 fig, 9 tab, 8 ref, 5 append. DOT Contract FA72WAI-318/316.

Descriptors: *Weather modification, *Fog, Electrical studies, Canal Zone, Cloud physics.
Identifiers: *Electrogasdynamic fog dispersal, Visibility.

An electrogasdynamic concept of fog dispersal was field tested on fogs in the Panama Canal Zone. Qualitative visibility improvements were obtained. Ten fog dispersal tests, employing 16 electrogasdynamic spray gun units, were conducted. Two of the tests could not be evaluated because of equipment malfunction and natural fog dissipation. While clearing trends were achieved during six out of eight tests, the magnitude and persistence of visibility improvement as well as the time to achieve such improvement varied widely from test to test. (Knapp-USGS)
W75-00232

A STAFF REPORT ON ALTERNATIVE WATER SUPPLY PROGRAMS FOR THE METROPOLITAN WASHINGTON, AREA.
Corps of Engineers, Boston, Mass. North Atlantic Div.
For primary bibliographic entry see Field 3D.
W75-00370

METEOROLOGICAL STUDIES IN RELATION TO CLOUD SEEDING EXPERIMENTS OVER SOUTH FLORIDA IN 1971,
Rosenstiel School of Marine and Atmospheric Science, Miami, Fla.
J. J. Fernandez-Partagas, and M. A. Estoque.
Final Report UM-RSMAS 72052, April 1972. 103 p, 54 fig, 2 tab, 23 ref.

Descriptors: *Precipitation(Atmospheric), *Rainfall, *Cloud seeding, *Meteorological data, *Florida, Droughts, Circulation, Atmospheric Physics, Gulf of Mexico.
Identifiers: Convergence-rainfall, Convergence.

Three meteorological studies are reported in this final report. The first deals with the general circulation and Florida rainfall patterns for the period April - July 1971. The second describes rainfall analysis in relation to 1971 cloud seeding. The third is a study of convergence-rainfall relationships over Florida. (NOAA)
W75-00482

HYDROLOGIC-ECONOMIC FEASIBILITY STUDY ON PRECIPITATION AUGMENTATION OVER THE GREAT LAKES,
Illinois State Water Survey, Urbana.
G. E. Stout, and W. C. Ackermann.
Final Report, March 1974. 29 p, 7 fig, 2 tab, 8 ref.

Descriptors: *Water level fluctuations, *Precipitation(Meteorology), *Evaporation, *Water quality, *Cloud seeding, Great Lakes, *Lake Michigan, Domestic wastes, Powerplants, Economics, Resources, Transportation, Water supply, Recreation.
Identifiers: Energy sources.

Thirty-two million people live within the Great Lakes Region and depend heavily upon this resource for transportation, power production, water supply, and recreation. Large differences in lake levels create many social and economic problems. Every increase of one inch in water level permits an additional 110 tons of cargo on the freighters now in use and 225 tons on the larger vessels now under construction. A change in water level of one inch in Lake Michigan is equivalent to one-third of the diversion of water that is used for domestic waste water dilution for the city of Chicago. The greatest benefit of the higher water levels is the energy producing capacity of the power industries. It was proposed that through cloud seeding one could recycle, the evaporative water which occurs when polar and arctic air masses cross the open water surface directly into the lake. Benefits would be greatest during the period of low lake levels. (NOAA)
W75-00508.

3C. Use Of Water Of Impaired Quality

WATER REGIME OF RICE FIELDS IRRIGATED WITH MINERALIZED WATERS,
Desert Inst., Ashkhabad (USSR).
I. N. Taran, and D. Babanazarov.
Probl Osvoeniya Pustyn'. 3, p 82-86, 1973. Illus.

Descriptors: Asia, *Rice, Mineral water, *Reclaimed water, *Water reuse, Irrigation, Plant growth, Nitrogen, Phosphorus, Potassium.
Identifiers: *USSR(Karakum canal).

To investigate water regime of rice fields irrigated by mineralized waters, sulfate-sodium waters of the Dzhar-Sy collector at 11-15 g/l mineralization rate and waters of the Karakum Canal (USSR), 0.4-1.0 g/l mineralization rate were used. Yield capacity of rice reaches 40-45 centners/ha fields irrigated with mineralized water and treated with 200 kg/ha N, 200 kg/ha P and 50 kg/ha K fertilizers. Water use in this instance increase up to 18-20 thousand cu m/ha.--Copyright 1974, Biological Abstracts, Inc.
W75-00176

EFFECT OF IRRIGATING AREAS WITH RICE WITH MINERALIZED WATER ON THE SOIL SALT DYNAMICS, (IN RUSSIAN),
Desert Inst., Ashkhabad (USSR).
A. S. Ovsyannikov.
Probl Osvoeniya Pustyn'. 3, p 78-82, 1973. English summary.

Descriptors: *Rice, *Irrigation, Saline water, *Saline soils, Brackish water.
Identifiers: Soil desalination.

Brackish (3-4 g/l) and weak saline (5-6 g/l) waters can be used to irrigate and, at the same time, to desalinate light and well drained soils sown to rice. The application of mineralized waters for irrigation and soil desalination extends the areas sown to rice and other agricultural crops.--Copyright 1974, Biological Abstracts, Inc.
W75-00524

3D. Conservation In Domestic and Municipal Use

FACTORS AFFECTING RESIDENTIAL WATER CONSUMPTION: THE MANAGERIAL VIEWPOINT,
Mississippi Univ., University. School of Business Administration.
For primary bibliographic entry see Field 6D.
W75-00139

SHALL WE DEVELOP MORE WATER,
Wisconsin Univ., Milwaukee. Dept. of Civil Engineering.
For primary bibliographic entry see Field 6B.
W75-00205

IDENTIFICATION OF PUBLICS IN WATER RESOURCES PLANNING,
Georgia Inst. of Tech., Atlanta. Dept. of City Planning.
For primary bibliographic entry see Field 6B.
W75-00268

A STAFF REPORT ON ALTERNATIVE WATER SUPPLY PROGRAMS FOR THE METROPOLITAN WASHINGTON, AREA.
Corps of Engineers, Boston, Mass. North Atlantic Div.
April, 1974. 115 p, 13 tab, 28 fig, 5 append.

Descriptors: *District of Columbia, *Water supply development, *Comprehansive planning, *Federal government, *Project planning, *Water resources development, Planning, Water policy, Regional planning, Water supply, water management(Applied), Water sources, Potential water supply, Water requirements, Water demand, Water resources, Water utilization, Water Resources Planning Act, River basin development, Water utilization, Future planning(Projected), Water law.

This report was prepared as part of the long range Northeastern United States Water Supply Study (NEWS). Its objective is to develop plans for supplying water which are consonant with the values and problems of a particular region. Plans designed to meet projected 30-day maximum demand for the Metropolitan Washington Area are presented. Shorter 'peak-load' needs will be treated later in the study. The feasibility of various technological alternatives was considered in terms of the plan's six objectives--low risk, limited environmental impact, low cost, control of growth,

flexibility, and social and economic equity. The following technologies were grouped together into five program mixes, water impoundment, interconnection, advanced wastewater treatment, use of the Potomac estuary, land treatment of sewage, and wells. Water demand reduction measures were included in all programs. Each mix presents the most feasible supply development program, within a defined set of priorities. These priorities are expressed as combinations of the six plan objectives. Responses to publication of this report and additional information from on-going studies will be used to evaluate and reformulate the programs. (Deckert-Florida)
W75-00370

3E. Conservation In Industry

CHEMICAL TREATMENT OF PLATING WASTE FOR REMOVAL OF HEAVY METALS,
Beaton and Corbin Mfg. Co., Southington, Conn.
For primary bibliographic entry see Field 5D.
W75-00010

POLLUTIONAL PROBLEMS AND RESEARCH NEEDS FOR AN OIL SHALE INDUSTRY,
Robert S. Kerr Environmental Research Lab., Ada, Okla.
For primary bibliographic entry see Field 5B.
W75-00012

WASTE WATER TREATMENT AND REUSE IN A METAL FINISHING JOB SHOP.
Williams (S. K.) Co., Wauwatosa, Wis.
For primary bibliographic entry see Field 5D.
W75-00015

3F. Conservation In Agriculture

SOIL-WATER-PLANT RELATIONS UTILIZING DIVIDED ROOT SYSTEMS OF SOYBEAN,
Georgia Univ., Athens. Dept. of Botany.
For primary bibliographic entry see Field 2I.
W75-00003

SOYBEAN WATER USE IN THE SHELTER OF A SLAT-FENCE WINDBREAK,
Connecticut Univ., Storrs. Dept. of Plant Science.
D. R. Miller, N. J. Rosenberg, and W. T. Bagley.
Agric Meteorol. Vol 11, No 3, p 405-418. 1973.

Descriptors: *Soybean, *Photosynthesis, *Evapotranspiration, Shelter belts, *Windbreaks.

Evaporative and photosynthetic flux rates were measured in wind sheltered and exposed irrigated soybeans in an eastern Great Plains location. Portable slat-fencing of 50% porosity was used to provide shelter. Evapotranspiration was measured with precision weighing lysimeters. CO2 flux was estimated from CO2 gradient measurements and calculated exchange coefficients. Multiplicative effects of the windbreak on the irrigated soybean crop over time were eliminated by frequent moves of the barrier between 2 sites in the experimental field. The intensity of turbulent exchange was decreased in the shelter. Vapor pressure, air temperature and CO2 concentration gradients were intensified in shelter. During 6 days of measurement, shelter caused a mean 20% decrease in evapotranspiration. The water saving was greatest when sensible heat advection was important. CO2 photosynthetic flux rates estimates suggest no difference caused by shelter effect.--Copyright 1974, Biological Abstracts, Inc.
W75-00016

AGRO-ECOLOGIC EVALUATION OF WEED ASSCIATIONS IN CROATIAN-SLOVENIAN 'BETWEEN RIVERS' AREA, (IN SERBO-CROATIAN),
Zagreb Univ. (Yugoslavia). Zavod Opcu Proizvode Bilja.
J. Kovacevic.
Poljopr Znan Smotra, 28, p 37-55, 1972.

Descriptors: *Weeds, Soils.
Identifiers: *Yugoslavia.

This review of 38 papers reports results of studies in the Croatian-Slovenian region between Sava and Drava rivers in the Croatian People's Republic (Yugoslavia). The region belongs to the area of climatic vegetation of Querco-Carpinetum croaticum. The climate is humid and the soils are flooded and extremely acid. The following weed associations were determined: Trifolium arvense-Scleranthus annuus on podzolic soils; Setaria glauca-Echinochloa crus-Galli on the same soils; Stachys palustris on marshy mineral soils; Aristolochia clematitis on areas of recent alluvium or dilluvium; Sinapis arvensis on carbonate soils and Chondrilla juncea-Coronilla varia on light sand soils.--Copyright 1974, Biological Abstracts, Inc.
W75-00100

WATER ANALYSIS IN THE KELETI CANAL (VIZVIZSGALATOK A KELETI FOCSATORNAN),
For primary bibliographic entry see Field 5B.
W75-00167

WATER REGIME OF RICE FIELDS IRRIGATED WITH MINERALIZED WATERS,
Desert Inst., Ashkhabad (USSR).
For primary bibliographic entry see Field 3C.
W75-00176

EFFECT OF VARIETY, SPACING AND SOIL FERTILITY ON GROWTH, FLOWERING AND FRUIT DEVELOPMENT IN GROUNDNUT (ARACHIS HYPOGAEA L.) UNDER ARID CONDITIONS,
Uttar Pradesh Inst. of Agricultural Sciences, Kanpur (India).
S. Bhan, and D. K. Misra.
Indian J Agric Sci. Vol 42, No 9, p 800-808. 1972. Illus.

Descriptors: *Moisture stress, Soil moisture, Fertilizers, *Arid lands, Growth rates.
Identifiers: Arachis hypogaea, *Groundnuts.

Early and better fruit development was observed in A. hypogaea plants that completed growth and flowering phases earlier. Prolonged vegetative growth delayed flowering and fruit setting and consequently resulted in poor fruit development because of increased moisture stress in the soil. Genetic factors governing erectness and short duration of the crop (as observed in 'AK 12-24'), wider row spacing and combined application of 20 kg N + 30 kg P2O5/ha induced rapid growth, early flowering and better fruit development.--Copyright 1974, Biological Abstracts, Inc.
W75-00352

EFFECT OF NITRATE IN DRINKING WATER ON REPRODUCTIVE AND PRODUCTIVE EFFICIENCY OF DAIRY CATTLE,
Wisconsin Univ., Madison. Dept. of Dairy Science, and Wisconsin Univ., Madison. Dept. of Agricultural Engineering.
For primary bibliographic entry see Field 5C.
W75-00428

CONGRESS SHOULD REEVALUATE THE 160-ACRE LIMITATION ON LAND ELIGIBLE TO RECEIVE WATER FROM FEDERAL WATER RESOURCES PROJECTS.
Comptroller General of the United States, Washington, D.C.
For primary bibliographic entry see Field 6E.
W75-00459

AMENDING THE ACT OF AUGUST 31, 1954, PROVIDING FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF THE MICHAUD FLATS IRRIGATION PROJECT.
For primary bibliographic entry see Field 6E.
W75-00461

RESPONSE OF COTTON (G. HIRSUTUM) TO PRE- AND POST- FLOWERING IRRIGATIONS,
College of Agriculture, Dharwar (India).
S. S. Meli, Y. H. Yadahalli, and G. N. Kulkarni.
Mysore J Agric Sci. Vol 7, No 1, p 19-24, 1973.

Descriptors: *Irrigation effects, *Cotton, Flowering, *Crop response.

Maximum yield (11.77 quintals/ha) was obtained with 2 pre-flowering and 2 post-flowering irrigations, followed by 2 post-flowering irrigations (10.22 Q/ha). Yield increased up to 66% compared to no irrigation.--Copyright 1974, Biological Abstracts, Inc.
W75-00521

AGROCLIMATIC REGIONS OF RAJASTHAN,
Central Arid Zone Research Inst., Jodhpur (India).
A. K. Sen.
Ann Arid Zone, Vol 11, No 1/2, p 31-40, 1972.

Descriptors: *Climate, Agriculture, Arid lands, *Arid climates.
Identifiers: *India(Rajasthan), Climatic zones, *Agroclimatic region.

To determine the quantitative relation between agricultural production and climate of Rajasthan, India, 3 methods dealing with the study of the climatic elements, availability of water at various levels and present cropping pattern were studied and different indices for agroclimatic zonation were worked out. The state was divided and mapped into 5 macro- and 10 micro agroclimatic regions.--Copyright 1974, Biological Abstracts, Inc.
W75-00522

EFFECTS OF WEED OCCURRENCE AND RICE GROWTH CHARACTERS UNDER THE IRRIGATION DEPTH IN TRANSPLANTED RICE, (IN KOREAN),
Yungnam Crop Experiment Station, Milyang (Republic of Korea).
J. K. Park, S. Yang, and K. Y. Chung.
Res Rep Off Rural Dev (Crop) (Suwon). 15, p 61-68, 1973, Illus. English summary.

Descriptors: *Irrigation effects, Weeds, *Rice, Growth rates.

Of the total number of weeds in the transplanted rice broad-leaved weeds comprised 83-87% followed by 11-13% sedges and 2-3% grasses. Echinochloa crus-galli continued to be controlled but some weeds tended to increase in number and weed weight. No difference in Cyperus in proportion to the increase in irrigation depth was noticed. Total weed weight tended to decrease rapidly up to 5cm of irrigation depth. After that is was decreased slowly until 15cm. 'Tongil' which has vigorous tillering ability and a short culm tended to have less in weed weight than 'Milsung' which has a smaller tillering ability with a longer culm. The rice culm length tended to be longer and there was an increase in tiller number with increasing irrigation depth. The relationship between dry weed weight and the panicle number of rice showed a negative correlation up to 0-3cm of irrigation depth. After that, there was no difference until 15cm. A higher yield was obtained under the 3-5cm of irrigation depth in weed free conditions and 5-7cm under the irrigation in weed competition con-

ditions.--Copyright 1974, Biological Abstracts, Inc.
W75-00523

PLANT-WATER MEASUREMENTS ON SOYBEANS SHELTERED BY TEMPORARY CORN WINDBREAKS,
Agricultural Research Service, Morris, Minn. North Central Soil Conservation Research Center.
J. K. Radke, and R. T. Hagstrom.
Crop Sci. Vol 13, No 5, p 543-548, 1973, Illus.

Descriptors: *Soybeans, Stomata, Transpiration, *Windbreaks, *Moisture stress, *Minnesota, Corn.

Double rows of corn (Zea mays L.) spaced at regular intervals in a soybean (Glycine max (L.) Merr.) field served as tempory windbreaks at two locations in western Minnesota (USA). In 1969 at Dumont, Minnesota, corn windbreaks were placed between every 14 rows of soybeans (every 11.4 m), and in 1970 at Lamberton, Minnesota, 22 rows of soybeans (17.5 m) separated the corn windbreaks. Moisture stress was high in 1969, but moisture was adequate in 1970. Small, white evaporimeters provided estimates of potential evaporation, soybean plant potometers furnished information on potential transpiration, and the stomatal resistances of the soybeam leaves were measured by a porometer and from leaf impressions. Windspeed and potential evaporation were reduced significantly over the 1st 7 or 8 soybean rows on the lee side of the windbreaks. Potential transpiration and stomatal resistance varied significantly among rows between corn windbreaks and in some cases showed cyclic trends over rows. Potential transpiration and stomatal resistance appeared to be directly related when moisture stress was low, but were inversely related when moisture stress was high. Sheltered soybean yield increases and variations over rows were largely an accumulation of the variations that occurred in the plant-water relations during the growing season.--Copyright 1974, Biological Abstracts, Inc.
W75-00525

ESTIMATION OF PLANT WATER STATUS WITH THE (BETA)-GAUGE,
Agricultural Research Council, Trumpington (England). Plant Breeding Inst.
For primary bibliographic entry see Field 7B.
W75-00529

4. WATER QUANTITY MANAGEMENT AND CONTROL

4A. Control Of Water On The Surface

FEASIBILITY STUDY, LAKE HOPE MINE DRAINAGE DEMONSTRATION PROJECT.
Ohio/Dept. of Natural Resources, Columbus.
For primary bibliographic entry see Field 5G.
W75-00011

COORDINATED OPERATION OF CENTRAL VALLEY AND STATE WATER PROJECTS,
California State Dept. of Water Resources, Sacramento. Div. of Operations and Maintenance.
For primary bibliographic entry see Field 6A.
W75-00023

PREDICTING THE MONTHLY AVERAGE CHANGES OF WATER STORAGE IN LAKE BALATON--BASED ON THE THEORY OF MARKOV PROCESSES,
Technical Univ. of Budapest (Hungary).
For primary bibliographic entry see Field 2H.
W75-00040

ANNUAL VARIATION OF SEEPAGE OF LAKES IN THE MORAINE AREA OF THE GERMAN DEMOCRATIC REPUBLIC,
Meteorologischer Dienst der Deutschen Demokratischen Republik, Berlin. Forschungsinstitut fuer Hydrometeorologie.
For primary bibliographic entry see Field 2H.
W75-00041

OPTIMUM WATER LEVEL REGULATION OF LAKE BALATON, HUNGARY,
Water Resources Center, Budapest (Hungary).
I. Bogardi, and B. Nagy.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 435-439, 1973. 2 fig, 5 ref.

Descriptors: *Water management(Applied), Hydraulics, *Reservoir operation, *Reservoir releases, *Dynamic programming, Optimization, Sluices, Water levels, Hydrologic systems, Markov processes, Hydrology, Lakes, Evaporation, Precipitation(Atmospheric), Inflow.
Identifiers: *Hungary(Lake Balaton).

An outline of the hydrological characteristics of Lake Balaton was given. High water levels at the end of winter during snow melt cause great damage to shore structures. In dry and warm summers, on the other hand, the shallow water level hinders recreation. Water level regulation is possible only by release sluice operation, since reservoirs cannot be constructed in the catchment. Due to hydrological uncertainties favorable water levels cannot be guaranteed with the required safety. An optimum strategy for water-level regulation was introduced. The model uses the methods of dynamic programming and Markov chains. Hydrological input is the time series of monthly water-level changes reflecting the resultant effect of precipitation, inflow and evaporation. The objective function minimizes expected losses for a given time horizon if optimum release strategy is used. Different loss functions were discussed and other uncertainties caused by wind waves were also considered. (See also W75-00029) (Terstriep-ISWS)
W75-00088

AN OPTIMIZATION MODEL FOR THE OPERATION OF LAKE KINNERET,
Tahal Consulting Engineers Ltd., Tel-Aviv (Israel).
M. Gablinger.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 440-446, 1973. 3 fig, 1 tab, 4 ref.

Descriptors: *Water management(Applied), Hydraulics, *Optimum development plans, *Water utilization, Economic efficiency, Lakes, Multiple-purpose projects, Hydrology.
Identifiers: *Israel(Lake Kinneret-Lake Tiberias), Optimal water allocation policy.

A scheme of spilling and pumping from Lake Kinneret (also called Lake Tiberias) was described. The plan sought was an optimum steady-state policy, i.e., one that would be the same for every state of the system (period of years, volume in the reservoir, inflow, etc.) for two consecutive years. Results demonstrate: (1) although the lake was but one element of a complex water resource system, it can be evaluated in isolation of the system; (2) the technique was suitable for this type problem, and it converged to an optimum solution, and (3) in spite of numerous states and time intervals which affected decision making, simple and workable operational policies were derived. (See also W75-00029) (Jess-ISWS)
W75-00089

WATER MANAGEMENT ON LAKE VELENCE WITH SPECIAL REFERENCE TO OPTIMUM WATER LEVEL,
Water Resources Center, Budapest (Hungary).
For primary bibliographic entry see Field 6A.
W75-00090

PLANNING A WATER RESOURCES SYSTEM WITH MULTI-PURPOSE RESERVOIRS BY BREAKING DOWN THE SYSTEM ACCORDING TO ITS VARIOUS FUNCTIONS,
Institut za Vodoprivredu Jaroslav Cerni, Belgrade (Yugoslavia).
For primary bibliographic entry see Field 6A.
W75-00091

DISTRIBUTION OF OUTFLOW FROM A LAKE WITH SERIALLY CORRELATED INFLOW,
Department of the Environment, Ottawa (Ontario). Inland Waters Directorate.
V. Klemes.
In: Hydrology of Lakes Symposium; Proceedings of the Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 459-461, 1973. 4 ref.

Descriptors: *Lakes, *Water management(Applied), *Inflow, *Distribution, *Routing, Markov processes, Mathematical studies, Reservoirs, Surface waters, Storage, Analytical techniques, Discharge(Water), Hydrology, Reservoirs.
Identifiers: Linear reservoirs, Nonlinear reservoirs, Correlated flows.

The serially correlated inflow was assumed to have the form of a first-order Markov chain. Outflow from a nonlinear reservoir with a serially correlated inflow was shown to equal outflow from a system of two reservoirs in series, the first linear and the second nonlinear, fed by a random inflow. The outflow distribution can be solved by the repeated use of two equations presented. (See also W75-00029) (Singh-ISWS)
W75-00092

RISK EVALUATION OF TIDAL-INFLUENCED FLOOD CONTROL RESERVOIR,
Technical Univ. of Denmark, Lyngby. Inst. of Hydrodynamics and Hydraulic Engineering.
D. Rosbjerg, and E. Hansen.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 496-503. 7 fig, 1 tab, 4 ref.

Descriptors: *Water management(Applied), *Flood control, *Tidal effects, *Dikes, *Reservoir storage, Runoff, Statistical methods, Water levels, Probability, Hydrology, Discharge(Water), Lakes.
Identifiers: *Denmark(Lake Rudbol so-Jutland), Poisson process.

Low-lying marsh areas in southwestern Jutland, Denmark, are protected by sea dikes against flooding from the North Sea. A natural lake, Rudbol so, has been utilized as a flood control reservoir for the inevitable freshwater runoff during periods of extremely high water levels in the North Sea. In such situations the normal freshwater discharge through the sluice during ebb periods may fail to take place for several tidal periods, thus creating a need for storage capacity behind the sea dikes. An analysis was made of 13 years of water-level records from Rudbol so, and the risk of flooding of the inland dike system was evaluated by use of two different statistical theories of extremes. One theory is based on the concept of a Poisson process and the other utilizes a newly developed approximate theory of extremes. The results were compared and given in graphical form in terms of the probability of exceedance once or more a year for various water levels. (See also W75-00029) (Singh-ISWS)

W75-00096

INFLUENCE OF STORAGE RESERVOIRS ON THE THERMAL REGIME OF RIVERS,
Panstwowy Instytut Hydrologiczno-Meteorologiczny, Gdynia (Poland).
B. Cyberska.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 504-510, 1973. 3 fig, 1 tab, 10 ref.

Descriptors: *Water management(Applied), *Reservoir storage, *Water temperature, Rivers, Climatology, Hydrology, Lakes, Thermal conductivity, Thermal properties, Air temperature.
Identifiers: *Poland, Dunajec River, Vistula River, Roznow Reservoir, Czchow Reservoir.

Storage reservoirs are causing significant deformation of the natural thermal regime of rivers. This is the result of water accumulation in the reservoirs. The extent of the differences in the character and intensity of ice phenomena depends on the correlation between natural conditions (climatic and hydrological conditions) and the kind of hydrotechnical constructions and how they are used. Variations in the temperature of water outflowing from reservoirs depend on the factors controlling them, mainly on the intensity of water exchange in the reservoir. If there were 15 exchanges of water during the year two equal exchanges occur: cooling and warming of the outflow water. Below this value the cooling process predominates, and over this value the warming process prevails. As the value departs from 15 per year in one of the other direction, apart from the extension of the duration of the process, variations of maximum water temperature increase too. A change of the duration of ice phenomena is the consequence of a rise of water temperature in the river in the autumn-winter period. For water temperature and for ice phenomena as well, the greatest variation occurs on the immediate downstream side of the reservoirs. With increasing distance from the reservoirs the variations become smaller. The size and reach of the effect of a storage reservoir on a river depends on meteorological conditions, and the amount of water outflow from the reservoir and on the water temperature variations that arise there. (See also W75-00029) (Dawes-ISWS)
W75-00097

CONTROL OF WATER BALANCE OF DRAINLESS LAKES IN THE FUTURE,
Akademiya Nauk SSSR, Moscow. Institut Geografii.
M. I. Lvovitch, and I. D. Tsigelnaya.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 511-515, 1973. 1 fig, 1 tab.

Descriptors: *Water management(Applied), *Water control, *Water level fluctuations, *Lakes, Water balance, Water conservation, Water resources development, Water distribution, Water importing, Hydrology, Water utilization, Reservoirs, Salinity.
Identifiers: *Aral Sea, Baltic Sea, USSR(Sirdarya River-Amudarya River).

The possibility of controlling the water balance of drainless lakes was shown with particular reference to the Aral Sea. The use of reservoirs, diversions from outside the basin, conservation in irrigation, industrial and municipal consumption, separation of the sea surface area with dams, and a system of controlling the Aral Sea level will prevent the increase in water salinity. A further technical and economic justification of ways of solving this problem is required. (See also W75-00029) (Dawes-ISWS)
W75-00098

AN INTERACTIVE ALGORITHM FOR THE MULTI-PURPOSE CONTROL OF A NATURAL LAKE,
Arizona Univ., Tuscon. Dept. of Systems and Industrial Engineering. Arizona Univ., Tuscon. Dept. of Hydrology and Water Resources.
R. English, C. C. Kisiel, and L. Duckstein.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 516-522, 1973. 4 fig, 12 ref. OWRT C-3259(3708)(3).

Descriptors: *Water management(Applied), *Hydraulics, *Lake stages, *Algorithms, Lakes, Control, Hydrology, Reservoirs, Mathematical models, Water utilization.
Identifiers: *Hungary(Lake Balaton), Sequential Multi-Objective Problem Solving Algorithm(SEMOPS).

A Sequential Multi-Objective Problem Solving Algorithm, SEMOPS, enables a decision maker to find a 'satisfactum' rather than an optimum in the multiple objective problem of controlling the level of a natural lake. Four goals of the lake level control were considered: recreation, flood control, low level control for quality, and irrigation. Each goal was expressed in its own units; a compromise between the lake level that would optimize the goal versus another may be found in an interactive manner that attempts to account for the psychology of a decision maker. A procedure was proposed to take the multi-period nature of the decision problem into consideration. (See also W75-00029) (Jess-ISWS)
W75-00099

CERIOPS TAGAL (PERR.) C. B. ROBINSON AT KOSI BAY,
University of Durban-Westville (South Africa). Dept. of Botany.
For primary bibliographic entry see Field 2L.
W75-00184

TESTING OF METHODS FOR DETERMINATION OF URBAN RUNOFF,
Dalton-Dalton-Little-Newport, Inc., Cleveland, Ohio.
J.-S. Chien.
Journal of the Hydraulics Division, Vol 100, No HY 7, p 1081-1082, July, 1974. 2 ref.

Descriptors: *Urban hydrology, Estimating equations, Infiltration, Distribution patterns, Hyetographs, Mannings equation, On-site investigations, Flow rates, Monitoring, Groundwater, Backwater, Reviews.
Identifiers: Sewer routing.

A state-of-the-art in urban hydrology is challenged with regards to the estimation of infiltration parameters and sewer routing procedures. The following factors should be considered in addition to the efforts endorsed by Papadakir and Preul (ASCE Proceedings Paper 9987): the adoption of individual hyetographs for each event with its associated catchment as input instead of using the average Thiessen hyetograph; field verification of Manning's n in the sensitivity study; consideration of possible backwater conditions from the downstream interceptor under high flow situation; groundwater infiltration and other inflows as part of the flow monitored. (Sandoski-FIRL)
W75-00212

HYDROLOGY OF THE DISMAL SWAMP, VIRGINIA-NORTH CAROLINA,
Geological Survey, Richmond, Va.
For primary bibliographic entry see Field 2F.
W75-00238

WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
M. Sniedovich, C. C. Kisiel, L. Duckstein, and D. R. Davis.
Available from NTIS, Springfield, Va. 22161 as COM-73-11773 Price $4.75 printed copy; $2.25 microfiche. Contract Report for the period July 1972-June 1973, July 1973. 96 p, 94 ref. NOAA-NWS 2-34108.

Descriptors: *Hydrologic data, *Flood data, *Economics, *Flood forecasting, Warning systems, Flood control, Flood protection, Social aspects, Non-structural alternatives.

The worth of hydrologic data used for short-term forecasts of floods is evaluated. The effectiveness of the forecasts is measured in terms of the entire system under consideration-that is the flood plain, rather than solely in hydrologic terms such as the mean error of forecast. Both the actual and potential worth of the forecasts are studied with emphasis on the effects of warming time, forecast error, response of the population, and hydrometric network on the end product of the system--that is, the social and economic improvement of the flood plain. An adequate evaluation, especially concerning the potential worth of the hydrologic data, requires a multidisciplinary study involving hydrologists, economists, sociologists, psychologists and flood plain authorities. In the light of continuous improvement in the scientific and technological aspects involved in the forecasting system, there is a need for a continuous reevaluation of the forecasting system as a potential alternative in flood control projects especially as a complementary alternative to the classical ones such as zoning and structures. (Knapp-USGS)
W75-00241

APPLICATION OF SENSITIVITY ANALYSIS TO RESERVOIR DESIGN AND WORTH OF STREAMFLOW DATA,
Geological Survey, Fort Collins, Colo.
For primary bibliographic entry see Field 8B.
W75-00244

LINEAR LEAST SQUARES PREDICTION FOR MULTIVARIATE TIME SERIES WITH MISSING OBSERVATIONS,
Geological Survey, Arlington, Va. Water Resources Div.
For primary bibliographic entry see Field 7C.
W75-00245

FLOOD ESTIMATION IN THE PRESENCE OF OUTLIERS,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 7C.
W75-00246

AN ANALYSIS OF LOCAL WATER-RELATED DISTRICTS IN NORTH DAKOTA,
North Dakota State Univ., Fargo. Water Resources Research Inst.
For primary bibliographic entry see Field 6E.
W75-00260

OPTIMAL REAL-TIME CONTROL OF URBAN STORMWATER DRAINAGE,
Cornell Univ., Ithaca, N.Y. Dept. of Environmental Engineering.
For primary bibliographic entry see Field 6A.
W75-00261

RECREATION WATER CLASSIFICATION SYSTEM AND CARRYING CAPACITY,
Idaho Univ., Moscow. Dept. of Civil Engineering.
For primary bibliographic entry see Field 6B.
W75-00278

RIPARIAN-APPROPRIATION CONFLICTS IN THE UPPER MIDWEST (A REGIONAL VIEW),
Economic Research Service (USDA), Washington, D.C. Farm Economics Div.
For primary bibliographic entry see Field 6E.
W75-00288

SURFACE WATERS: REASONABLE USE RULE,
For primary bibliographic entry see Field 6E.
W75-00290

PRIVATE RIGHTS UNDER ILLINOIS DRAINAGE LAW,
For primary bibliographic entry see Field 6E.
W75-00291

ATCHAFALAYA RIVER AND BAYOUS, CHENE, BOEUF, AND BLACK, LOUISIANA (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, New Orleans, La.
Available from the National Technical Information Service, Springfield, Va. 22161 as EIS-LA-74-0103-F, $5.75 in paper copy, $2.25 microfiche. January 17, 1974. 135 p, 7 tab, 2 map.

Descriptors: *Environmental effects, *Louisiana, *Inland waterways, *Dredging, *Coastal marshes, Gulf Coastal Plain, Mississippi River Basin, Canal construction, Administrative agencies, Federal government, Channel improvement, Bayous, Wetlands, Deltas, Engineering, Gulf of Mexico, Offshore platforms, Canals, Ecology, Wildlife habitats, Aquatic habitats, Spoil banks, Disposal, Economic justification, Regional development.
Identifiers: *Environmental Impact Statements, *Coastal zone management, *Coastal waters.

The enlargement of existing navigation channels in the Atchafalaya River and Bayous Chene, Boeuf, and Black in southern Louisiana is proposed to permit the passage of large offshore drilling rigs and related marine equipment. The project area is deltaic marshland, containing many inland lakes and bays. 350 acres of swamp and marshland will be converted to new channel and an additional 7,000 acres of swamp and marshland will be significantly altered by the disposal of dredge spoil, resulting in the loss of aquatic and wildlife habitat. The project will have no effect upon salinity values in the project area, however, temporary increases in turbidity will occur during construction and maintenance operations. Several alternate channel alignments were considered, but were rejected as being more harmful to the environment than the proposed plan. The alternative of no action was rejected in light of the economic benefits which would be lost if the channel is not constructed. While this project will enhance the economic future of the region, there is considerable opposition both public and private, due to its adverse environmental effects. (Deckert-Florida)
W75-00293

OPERATION OF COUGAR LAKE PROJECT AND CONSTRUCTION OF MCKENZIE RIVER SALMON HATCHERY, MCKENZIE RIVER BASIN, LANE COUNTY, OREGON (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, Portland, Oreg.
Available from the National Technical Information Service, Springfield, Va. 22161 as EIS-OR-73-1918-F, $7.00 in paper copy, $2.25 microfiche. Dec. 11, 1973. 187 p, 21 fig, 15 tab.

Descriptors: *Environmental effects, *Reservoir operation, *Reservoir fisheries, *Oregon, *Governmental interrelations, Water management(Applied), Watersheds(Basins), Dams, Hydroelectric power, Engineering structures, Flood control, Flood protection, Low-flow augmentation, River regulation, Water control, Recreation, Fish hatcheries, Reservoirs, Reservoir releases, Drawdown, Watershed management, Multiple-purpose reservoirs, Bank erosion, Federal government, Administrative agencies, Fish management.
Identifiers: *Environmental Impact Statements, *Dam effects, *Lane Co(Oreg).

This project is located in the McKenzie River Basin in western Oregon. The proposed action consists of: the continuation of present policies governing the operation of Cougar Lake project for flood control, power generation, low-flow augmentation, and recreation; the construction of a new fish hatchery to replace runs of spring chinook salmon eliminated by Cougar Dam; and site restoration at Cougar Lake. The area is largely undeveloped and widely known for the beauty of its forested mountains. Reservoir flood control operations will result in improved water quality and navigation downstream, and will enhance the development of the flood plain. The new hatchery will add 1.2 million smolts annually to the river. Reservoir drawdown expose bare banks to erosion, drain nutrients from the reservoir, contribute to bank erosion downstream, and lower stream temperature thereby hindering the spawning activity of adult salmon. Construction of the hatchery will temporarily increase turbidity, and its operation will require lowering of the minimum flow level downstream. Various changes in operational policies were considered inferior to the proposed plan. This action is consistent with long-term development plans for the region. There is some opposition to the new hatchery due to its adverse effect upon downstream water quality. (Deckert-Florida)
W75-00294

THE POTOMAC: PUTTING THE PIECES TOGETHER.
Interstate Commission on the Potomac River Basin, Bethesda, Md.
For primary bibliographic entry see Field 6E.
W75-00295

HIGHWAYS--FLOOD DAMAGE--PROPOSED MODIFICATION OF THE COMMON ENEMY RULE,
For primary bibliographic entry see Field 6E.
W75-00296

ROLE OF LOCAL GOVERNMENT IN WATER LAW,
For primary bibliographic entry see Field 6E.
W75-00298

NORTH SIDE COLLECTION SYSTEM FRYING-PAN-ARKANSAS PROJECT, COLORADO (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Bureau of Reclamation, Denver, Colo.
For primary bibliographic entry see Field 8A.
W75-00299

DIVERSION OF LAKE MICHIGAN WATERS,
Michigan Attorney General's Office, East Lansing.
For primary bibliographic entry see Field 6E.
W75-00303

SPILLWAY DESIGN FOR SERIES OF RESERVOIRS,
Pacific Gas and Electric Co., San Francisco, Calif.
For primary bibliographic entry see Field 8B.
W75-00315

STUDIES IN THE DYNAMICS AND CONTROL OF WOODY WEEDS IN SEMI-ARID QUEENSLAND: 2. CASSIA NEMOPHILA AND C. ARTEMISIOIDES,
Department of Primary Industries, Brisbane (Australia).
G. N. Batianoff, and W. H. Burrows.
Queensl J Agric Anim Sci, Vol 30, No 1, p 65-71, 1973, Illus.

Descriptors: *Australia, Plant growth, Ecology, *Weed control, Herbicides, *Weeds, Semiarid climates, Arid lands.
Identifiers: Cassia-artemisiodes, Cassia-nemophila, Picloram, *Queensland(Aust), *Woody weeds.

The population of Cassia nemophila and C. artemisioides on a water redistribution scheme in the Cheepie district (Queensland, Australia) is tending to stabilize after an initial rapid spread and increase in density. Control of these plants through heavy stocking with sheep and by plowing was not achieved. Chemical sprays (2,4,5-T and combinations of picloram with 2,4,5-T and 2-4-D) killed species of Cassia, at high rates. The results are discussed in terms of the ecological implications of improved water relations in this semi-arid environment, and it is suggested that grasses common to more mesic sites could in time replace both species of Cassia.--Copyright 1974, Biological Abstracts, Inc.
W75-00337

RAINFALL INTERCEPTION IN MIXED GRASS PRAIRIE,
Saskatchewan Univ., Saskatoon.
For primary bibliographic entry see Field 2I.
W75-00362

BILL TO ESTABLISH LAND USE POLICY.
House, Washington, D.C.
For primary bibliographic entry see Field 6E.
W75-00365

BRUSH BAYOU, LOUISIANA. ASSOCIATED WATER FEATURE, BOGGY AND CYPRESS BAYOUS, WALLACE LAKE, (FINAL ENVIRONMENTAL IMPACT STATEMENT),.
Army Engineer District, New Orleans, La.

Descriptors: *Environmental effects, *Channel improvement, *Flood protection, *Federal government, *Lousiana, Dredging, Flood control, Channeling, Channels, Streams, Bayous, Flood plains, Floods, River basin development, Water management(Applied), Floodways, Watershed management, Flood routing, Gulf Coast plain, Land management, Water resources development, Conservation.
Identifiers: *Caddo Parish(La), *Environmental Impact Statements.

This project involves enlargement and/or realignment of a segment of the Brush Bayou channel to reduce flooding and consequential damages to the city of Shreveport, Louisiana. Implementation involves disposal of soil, relocation and/or modification of bridges and utility crossings, and initiation of beautification measures. The bayou has been dedicated as a drainage ditch for several generations, but one mile of the bottom reach has been channelized or realigned. The recommended alterations will make available 700 acres of land for intensive urban development and utilization. The proposed land use changes will impose minor adverse impacts upon nearby forest, wildlife and water resources. Structural and non-structural alternatives were considered. Long-term utilization and productivity of the flood plain resources will be enhanced, with minimal adverse effects upon short-term uses. Comments from environmental agencies were considered in the formulation of protective and remedial measures included in the project. (Deckert-Florida)
W75-00367

HANDBOOK FOR REGIONAL OR RIVER BASIN PLANNING, (ANNOTATED DRAFT OUTLINE) (LEVEL B).
Water Resources Council, Washington, D.C.

For primary bibliographic entry see Field 6B.
W75-00369

UPPER SUWANNEE RIVER, EVALUATION OF A PROPOSED DRI AS AN AREA OF CRITICAL STATE CONCERN, COLUMBIA AND HAMILTON COUNTIES, FLORIDA.
Florida Div. of State Planning, Tallahassee. Bureau of Land Planning.
Report DSP-BLP-C-3-7-74, March, 1974. 31 p, 2 fig, 3 append.

Descriptors: *Environmental effects, *Flood plains, *Mining, *Resources development, *Water pollution control, Springs, Rivers, Floods, Flood control, Toxins, Fish conservation, Sediment control, Recreation, Scenery, National historic sites, State governments, State jurisdiction, Regulation, Administrative agencies, Natural resources, Conservation, Construction, Florida, Land management, Water treatment, Wildlife, Administration, Flood plains, Adoption of practices, Social aspects.
Identifiers: *Environmental Impact Statements, Administrative regulations.

The District of Regional Impact (DRI), LOCATED IN Hamilton and Columbia Counties, Florida, consisted of a major expansion of an existing phosphate mining and processing operation, owned by the Occidental Chemical Company and involving a thirty mile reach of the Suwannee River. The Bureau of Land Planning recommended that the DRI be designated an area of critical state concern, unless plans for expansion were modified to prevent environmental damage. The most serious dangers were posed by flooding of mining operations which have significant potential for destroying the natural beauty of the area by carrying sediments, nutrients, and toxins into natural waters and causing fish kills, turbidity and mud deposits downstream. Preventive protection was the only real environmental protection available. The State could accomplish this by designating DRI an area of critical conern. Occidental proposed, however, to protect the area's resources by withdrawing from proposed mining operations the most valuable 10,000 acres of the DRI, the flood plains of the Upper Suwannee and nearby springs. This proposal, commended by the Bureau, made it unnecessary to designate the area as one of critical concern. (Dillingham-Florida)
W75-00372

REPORT OF PROCEEDINGS CONCERNING THE RECLASSIFICATION OF VARIOUS STREAMS IN NORTH CAROLINA, SECTION 1, HICKORY PUBLIC HEARING JUNE 29, 1972.
North Carolina Dept. of Natural and Economic Resources, Raleigh. Office of Water and Air Resources.
July 1, 1973. 181 p, 7 tab.

Descriptors: *River basin development, *River regulation, *Tributaries, *Water policy, *Water zoning, Water pollution control, Water quality control, Planning, Legislation, Watershed management, Water resources development, Drainage systems, Legal aspects, River systems, Rivers, River basin commissions, Classification, *North Carolina, Administrative agencies.

This is the first in a series of three records of public hearings held by the Water and Air Quality Control Committee of the North Carolina Board of Water and Air Resources. The hearings concerned state-wide proposals for upgrading the quality of surface waters in sixteen river basins by appropriate changes in their classification. Included are copies of all materials, briefs, and letters presented, as well as the transcript of the proceedings, at the Hickory public hearing on June 29, 1972. Also included are sections of the Laws of North Carolina relating to the policy of the state concerning its water resources and the assignment of classifications to surface waters within the state. Also included are the Rules Applicable to Classifications and Water Quality Standards, adopted by the North Carolina Board of Water and Air Resources. Discussion at this hearing concerned the classifcation of streams in the Hiwassee River Basin, the Little Tennessee River Basin, the French Broad River Basin, the Broad River Basin, the New River Basin, the Watanga River Basin, and the Catawba River Basin. (Craig-Florida)
W75-00373

THE FUNGAL FLORA OF WATERHYACINTH IN FLORIDA,
Florida Univ., Gainesville. Dept. of Plant Pathology.
For primary bibliographic entry see Field 5G.
W75-00423

HISTORY OF DRAINAGE CHANNEL IMPROVEMENT IN THE VERMILION RIVER WATERSHED, WABASH BASIN,
Illinois State Water Survey, Urbana.
Ralph C. Hay, and John B. Stall.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 782 $3.75 in paper copy, $2.25 in microfiche. Illinois Water Resources Center, Urbana, Research Report No 90, September 1974, 45 p, 4 tab, 18 fig, 18 ref. OWRR A -068-ILL(1), 14-31-0001-4013.

Descriptors: Channels, Drainage, *Drainage districts, Swamps, *Illinois, Legal aspects, *Land reclamation, Dredging.
Identifiers: *Drainage history, Wabash basin, *Vermilion River watershed(Ill).

For this 1250-square-mile basin in three counties in east-central Illinois, documentation is given for the 105 legal drainage districts formed between 1880 and 1974 to provide for surface drainage. Also traced is the human and social drama associated with the 150-year conversion of swamp to rich cropland. When Illinois became a state in 1818, and for decades afterward during which early settlers came in, east-central Illinois was a wide, flat swamp expanse covered with big bluestem and other swamp grasses. Drainage ditches were constructed by floating dredges assembled at the site. Upland ditches were made straight to serve man's needs as there were no natural curving streams or drainage channels to follow. A 1908 improvement of Saline Branch main ditch shortened it from 19 to 14 miles; the grade was increased from 3 to 4 feet per mile. This historical study reminds readers of the vast amount of brutally hard work and sustained effort contributed by thousands of people to conquer the swamps, to convert them to rich cropland, and to provide the man-made drainage improvements which are accepted as normal by most people in 1974. The legal drainage districts are still in existence and carry out maintenance of ditches. They offer considerable potential for working with other units of local government to enhance further developments in water resources, environment, and drainage.
W75-00424

MORGAN CITY, LOUISIANA, AND VICINITY (FINAL ENVIRONMENTAL STATEMENT).
Army Engineer District, New Orleans, La.
For primary bibliographic entry see Field 8A.
W75-00474

MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI, VOL I-II (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, St. Louis, Mo.
For primary bibliographic entry see Field 8A.
W75-00478

A DYNAMIC MODEL OF STAGE-DISCHARGE RELATIONS AFFECTED BY CHANGING DISCHARGE,
National Weather Service, Silver Spring, Md. Office of Hydrology.
D. L. Fread.
NOAA Technical Memorandum NWS HYDRO-16, November 1973. 38 p, 19 fig, 1 tab, 9 ref, 2 append.

Descriptors: *Streamflow forecasting, *Streamflow, *Flood discharge, *Stage-discharge relations, Forecasting, Computer programs, Roughness(Hydraulics), Hydrographs, Mathematical models.
Identifiers: Bottom slope, Energy slope, Channel slope, Dynamic loop.

A mathematical model is developed to simulate the dynamic relationship which exists between stage and discharge when the energy slope is variable due to the effects of changing discharge. The model enables either stage or discharge to be computed if the other is specified (measured or predicted) and the channel slope, cross-sectional area and roughness properties are known. The model is tested on several stage-discharge relations, which are influenced significantly by changing discharge, and found to provide excellent results. Also presented is a simple and easily-applied graphical procedure to estimate the magnitude of the changing discharge effect on stage-discharge ratings.
W75-00493

HYDROLOGIC-ECONOMIC FEASIBILITY STUDY ON PRECIPITATION AUGMENTATION OVER THE GREAT LAKES,
Illinois State Water Survey, Urbana.
For primary bibliographic entry see Field 3B.
W75-00508

WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
For primary bibliographic entry see Field 2E.
W75-00515

FLOOD PLAIN INFORMATION: GLACIER CREEK, GIRDWOOD, ALASKA.
Army Engineer District, Anchorage, Alaska.
Prepared for the Greater Anchorage Borough, August 1969. 28 p, 6 fig, 3 tab, 10 plates.

Descriptors: *Flood forecasting, *Flood plains, *Flood damage, *Alaska, Flood profiles, Flood stages, Obstruction to flow, Land use, Urbanization, Planning, Erosion, Glaciation.
Identifiers: *Glacier Creek(Ak), Girdwood(Ak), Mt. Alyeska(Ak), Floodplain management, Standard project flood, Intermediate regional flood.

The relatively narrow valley extending from Alyeska airstrip to Seward Highway is relatively underdeveloped since the town of Girdwood was relocated after the earthquake in March 1964. Despite a preliminary study which determined that the picturesque new townsite was subject to flood damage, the area was subdivided by the state and lots were auctioned off. Most floods result from intense rainfall with a base flow in the fall. Three bridges, small islands, and sharp meanders could obstruct the flow, cause changes in the course, and create a serious situation, which may be complicated by many other streams which enter from surrounding rough terrain. The only protection is a sand bag dike for high tides, but it is located at the original townsite. The greatest flood occurred in September 1927. Since the stream gage has been in operation (1965), a flood in 1967 was recorded at a surface elevation of 108.0 ft. From analysis of rainfall and flood characteristics in the 'general region,' an Intermediate Regional Flood would produce surface elevation of 111.7 ft. and peak flow of 14,000 cfs, and Standard Project Flood

would produce 114.0 ft. and 26,000 cfs respectively. In light of the proposed development and the surrounding winter resort area of Mt. Alyeska which is growing at a rapid pace, there is a great need to control the floodplains and guide future development of Girdwood to minimize vulnerability to flood damage. (Diefendorf-North Carolina)
W75-00539

FLOOD PLAIN INFORMATION; CHATTAHOOCHEE RIVER, BUFORD DAM TO WHITESBURG, GEORGIA.
Army Engineer District, Mobile, Ala.
Prepared for the Atlanta Regional Commission, Atlanta, Georgia, November, 1973. 16 p, 6 tab, 50 plates.

Descriptors: *Floods, *Flooding, *Flood plains, *Floodplain zoning, Flood control, Reservoirs, *Georgia.
Identifiers: Atlanta(Ga), *Buford Dam(Ga), *Chattahoochee River(Ga), Whitesburg(Ga), Intermediate Regional Flood(IRF), Standard Project Flood(SPF).

The reach of the Chattahoochee River covered in this report includes the counties of Coweta, Carroll, Fulton, Cobb, Douglas, Forsyth and Gwinnett. The drainage area is 1390 square miles with a floodplain varying in width from 1600 to 3200 feet with an average slope of 3 1/2 feet per mile. Except for the intense development of Atlanta, the floodplain is mostly rural. Buford Dam, 35 miles northeast of Atlanta, and its reservoir, Lake Sidney Lanier, provide storage for flood control, power, recreation, industrial and domestic supplies and low flood augmentation. When storms are centered over the river basin above the dam, the storage capacity of 637,000 acre feet is effective in reducing floods. Frontal type storms cause winter and spring flooding lasting to 4 days and covering large areas. Summer thunderstorms with high intensities cover small areas. Natural and man-made obstructions include 35 bridges and associated approach fills that restrict the flood flow. Floodplain zoning ordinances have been enacted by five counties: Cobb, Forsyth, Fulton, Douglas and Gwinnett. Counties as well as the city of Atlanta. Since the completion of Buford Dam, the largest flood in Atlanta was February 25, 1961 cresting at 18.3 feet. The most recent flood occurred on March 17, 1973 cresting at 16.4 feet. Although the dam reduced flood probability, the drainage area is susceptible to severe flooding during an Intermediate Regional Flood and Standard Project Flood resulting in property damage. This report provides a basis for the adoption of land use controls to guide floodplain development. (Salzman-North Carolina)
W75-00540

FLOOD PLAIN INFORMATION: NEABSCO CREEK AND COW BRANCH, PRINCE WILLIAM COUNTY, VIRGINIA,
Army Engineer District, Baltimore, Md.
Prepared for Prince William County Board of County Supervisors, September, 1973. 25 p, 10 fig, 8 tab, 12 plates.

Descriptors: *Flood forecasting, *Floodplains, *Flood damage, Flood profiles, Flood stages, Obstruction to flow, Land use, Planning, *Virginia, Potomac River.
Identifiers: *Neabsco Creek(Va), Cow Branch(Va), Prince William County(Va), Tropical Storm Agnes, Floodplain management, Standard Project Flood, Intermediate Regional Flood.

A minor tributary of the Potomac River, Neabsco Creek follows a winding course through a narrow floodplain bounded by small steep hills. The residential and commercial areas in the floodplain were damaged by the June 1972 flood resulting from Tropical Storm Agnes, the greatest flood in recent history as determined from interviews. Continuing population growth imposes pressures for additional development, altering the environmental and ecological aspect of the watershed. Floods, generally resulting from high runoff throughout the basin and inadequate bridge openings, tend to occur during the summer, with thunderstorms presenting the greatest flood hazard. They generally rise quickly, have short periods out of banks, and have a high main channel velocity. Analyses of rainfall and runoff characteristics in the general region were used to determine future flood data for this ungaged stream and its steeper tributary called Cow Branch. Intermediate Regional Flood (IRF) depths could range from 5 to 26 ft. in Neabsco Creek and from 3 to 17 ft. in Cow Branch, with IRF peak discharge of 8000 cfs and 2800 cfs respectively. Standard Project Flood (SPF) determinations indicate depths of flow range from 6 to 27 ft. above stream bed in Neabsco, and from 4 to 21 ft. in Cow Branch; SPF peak discharges are estimated at 11,500 cfs and 3,900 cfs respectively. There are no existing, authorized, or proposed flood control projects although the county does have a disaster relief plan. This study provides a basis for guiding future development on the floodplains to minimize vulnerability to flood damage. (Diefendorf-North Carolina)
W75-00542

FLOOD PLAIN INFORMATION: EAST BRANCH BRANDYWINE CREEK, (DOWNINGTOWN TO THE JUNCTION OF EAST AND WEST BRANCHES) CHESTER COUNTY, PENNSYLVANIA,
Army Engineer District, Philadelphia, Pa.
Prepared for the Chester County Planning Commission, December 1970. 51 p, 8 fig, 13 tab, 13 plates.

Descriptors: *Flood forecasting, *Floodplains, *Flood damage, *Pennsylvania, Flood profiles, Flood stage, Historic floods, Obstruction to flow, Land use, Planning, Reservoirs, Flood control.
Identifiers: *East Branch Brandywine Creek(Pa), Downingtown(Pa), Chester County(Pa), Soil Conservation Service, Floodplain management, Standard Project Flood(SPF), Intermediate Regional Flood(IRF).

This study, aimed at aiding in the solution to flood problems and in the best utilization of flood prone lands, covers 10.8 stream miles from the junction of the East and West Branches of Brandywine Creek to the northern limits of the City of Dowingtown, Pennsylvania. The wide valley narrows at Dowingtown, the only highly developed reach of East Branch. Three to 4 minor floods occur annually, causing damage to Dowingtown's low, flat, wide floodplain. Most floods occur in summer and fall, resulting from heavy rains within the watershed. Fifteen bridges and 2 dams create obstructions to flood flow which generally rises to extreme flood peaks in a relatively short time period. The maximum flood, on Aug 9, 1942, reached an elevation of 238.7 ft., mean sea level datum (m.s.l.d.). At the stream gage in Downingtown, an Intermediate Regional Flood (IRA) would reach 239.5 ft., m.s.l.d., and a Standard Project Flood (SPF) would reach 240.1 ft., m.s.l.d. With the proposed Soil Conservation Service flood control reservoirs in operation in the upstream drainage area, an IRF would be reduced by 3.4 ft. and a SPF by 2.5 ft. Three single-purpose flood control and 3 multi-purpose structures proposed under the Supplemental Work Plan prepared for this watershed by the Chester County Water Resources Authority would reduce annual damages by 90% at Downingtown and by 96% in uptown communities. (Diefendorf-North Carolina)
W75-00543

SPECIAL FLOOD HAZARD INFORMATION REPORT; COOSA RIVER-ETOWAH RIVER-OOSTANAULA RIVER, ROME, FLOYD COUNTY, GEORGIA,
Army Engineer District, Mobile, Ala.
Prepared for Rome-Floyd County Planning Commission, February, 1973. 22 p, 10 fig, 4 tab, 6 plates.

Descriptors: *Floods, *Flooding, *Flood control, *Levees, *Georgia, Flood protection, Dams, Historic floods.
Identifiers: *Rome(Ga), Floyd County(Ga), Coosa River(Ga), Etowah River(Ga), Oostanaula River(Ga), Intermediate Regional Flood(IRF), Standard Project Flood(SPF).

The Etowah and Oostanaula Rivers join in Rome to form the Coosa River which is a tributary to the Alabama River. Etowah's steep slopes and elongated shape are conducive to flash storm run-off. Storm run-off from fan-shaped Oostanaula basin of mostly cleared agricultural land is slower in reaching the main channel but coincides with the recession flows of the Etowah to produce a rather flat peak, producing floods that may last as long as 12 days in Rome. Floodplain development includes commercial, industrial and residential as well as agricultural. Floods caused by frontal-type storms occur in winter and early spring; summer flooding is generally of the thunderstorm type. A levee system in the fourth ward of Rome was constructed at 605 feet mean sea level datum (msld) which is 3 feet above the highest known flood in April of 1886. The most recent flood, May 4, 1964 crested at 591.4 feet msld. Allatoona Dam, 48 miles north of Rome, affects flood stage depending upon the rainfall distribution. Carters Dam under construction 75 miles north of Rome on a tributary of the Oostanaula will have little effect in the reduction of floods. No floodplain regulations exist. An Intermediate Regional Flood (IRF) could crest at 597.5 feet msld. and the Standard Project Flood would be 608 feet msld. Both would result in inundation of residential and commercial sections causing hazardous conditions. This report furnishes a basis for the adoption of land use controls to guide floodplain development. (Salzman-North Carolina)
W75-00544

FLOOD PLAIN INFORMATION: DE NEVEU CREEK, FOND DU LAC RIVER, MAIN STEM - EAST BRANCH - WEST BRANCH, FOND DU LAC COUNTY, WISCONSIN,
Army Engineer District, Chicago, Ill.
Prepared for Fonk du Lac County and the city of Fond du Lac, Wisconsin, September, 1972. 37 p, 20 fig, 8 tab, 18 plates.

Descriptors: *Floods, *Flooding, *Flood plains, *Flood protection, Flood control, Historic floods, Dikes, *Wisconsin.
Identifiers: Fond du Lac(Wis), *Fond du Lac River(Wis), Fond du Lac County(Wis), De Neveu Creek(Wis), Lake Winnebago(Wis).

Fond du Lac River, formed by the junction of the East and West branches, slopes at an average of 3.9 feet per mile before flowing into Lake Winnebago. De Neveu Creek, located to the east of Fond du Lac River, slopes at an average of 14.7 feet per mile before emptying into Lake Winnebago. Total drainage area contributing to run-off is 365.1 square miles. Most of the soil in the watershed allows for high runoff, with undeveloped drainage patterns. The floodplain within the city includes residential, commercial and industrial development on flat topgrade which forced the city to construct 19 lift stations for removal of run-off. The De Neveu Creek floodplain which includes residential and commercial establishments is protected by dikes and several pumping stations. Flooding in spring occurs due to snowmelt, ice jams and rainfall. Summer and fall floods are caused by intense rainfall. Windtides on Lake Winabago occurring simultaneously with watershed run-off incur flooding. Ice jams in the spring are broken up to minimize flood hazards. No zoning ordinances exist. The highest flood in August 1924 crested at 752.5 feet, mean sea level datum (msld) lasting 3 days and causing great

damage. The most recent flood on February 10, 1966 resulted from high rains, melting snow and ice jams. Damage to developed areas was severe. An Intermediate Regional Flood would be of similar magnitude as the August 1924 flood; however, a Standard Project Flood would crest at 761.7 feet msld. Damage by both types would be severe. The report furnishes a basis for the adoption of land use controls to guide floodplain development. (Salzman-North Carolina)
W75-00545

FLOOD PLAIN INFORMATION: PENNYPACK CREEK, (MEADOW BROOK, SOUTHHAMPTON CREEK, HUNTINGDON VALLEY CREEK, BLAIR MILL RUN) MONTGOMERY COUNTY, PA,
Army Engineer District, Philadelphia, Pa.
Prepared for the Montgomery County Planning Commission, March 1973, 32 p, 16 fig, 9 tab, 19 plates.

Descriptors: *Flood forecasting, *Flood plains, *Flood damage, *Flood profiles, Flood stages, Obstruction to flow, Land use, *Pennsylvania, Historic floods.
Identifiers: *Pennypack Creek(Pa), *Montgomery County(Pa), Philadelphia County(Pa), Bucks County(Pa), Flood plain management, Standard Project Flood, Intermediate Regional Flood.

Meandering through rolling hills with a floodplain that is wide and gently sloping, the 11.8 miles study reach begins at the Pine Road stream gage near the Philadelphia-Montgomery County line and ends upstream at the Creek's headwaters. Suburban-type development is continuing at a rapid pace on the almost completely developed floodplain. Seventy five bridges or culverts and 9 dams with no flood control capacity create obstructions to flow along the Pennypack Creek and its tributaries - Meadow Brook, Huntingdon Valley Creek, Southamption Creek, and Blair Mill Run. Minor floods occur in all seasons and major floods result from long-duration storms. The record flood occurred on July 14, 1931, the most severe storm on Nov. 25, 1950, and the highest recorded flow on Aug. 26, 1971 at 91.9 ft. mean sea level. At the Pine Road-U.S.G.S. Gage, an Intermediate Regional Flood (IRF) would rise to 95.4 ft. m.s.l. with a peak discharge of 10,500 cfs, and a Standard Project Flood (SPF) would rise to 97.7 ft. m.s.l. with 13,800 cfs peak discharge. Both types of floods would inundate the residential areas. The information presented about flood potential and flood hazards is important for comprehensive land use planning and for management decisions concerning floodplain utilization. (Diefendorf-North Carolina)
W75-00546

FLOOD PLAIN INFORMATION; SHEBOYGAN RIVER AND MULLET RIVER, SHEBOYGAN COUNTY, WISCONSIN.
Army Engineer District, Chicago, Ill.
Prepared for City of Sheboygan, City of Sheboygan Falls, City of Plymouth, Village of Kohler, Town of Sheboygan and Sheboygan County, Wisconsin. August, 1971. 66 p, 50 fig, 11 tab, 27 plates.

Descriptors: *Floods, *Flooding, *Floodplains, *Flood plain zoning, Flood control, Flood protection, *Wisconsin.
Identifiers: *Sheboygan River(Wis), *Mullet River(Wis), Sheboygan(Wis), Plymouth(Wis), Sheboygan Falls(Wis).

Four communities, Sheboygan, Kohler, Plymouth and Sheboygan Falls Wisconsin are within the floodplain which extends from the source of the Sheboygan River to its mouth on Lake Michigan over rolling lands used primarily for agricultural and wetland developments. The residential and commercial developments in the floodplain have been inundated by flooding. Weather records, newspaper articles, photographs and stream gage records provide most of the information. Main flood season is late winter and spring months resulting from a combination of fast snowmelt, intense rainfall accompanied by ice jams and the presence of ground frost which increases runoff. Summer flooding occurs dur to intense rainfall over a prolonged period of time. Duration of floods varies from one to three or four days. In conjunction with the Wisconsin Water Resources Act, floodplain zoning and sanitary ordinances to control floodplain development have been adopted by local governments. No flood control projects along either stream exist. Innumerable bridges and six dams obstruct the flood flow. The greatest known flood occurred in June, 1905 cresting at 596.2 feet mean sea level. The most recent flood, in June 1968 had an elevation of 589.6 feet. Both caused extensive damage to urban and agricultural development. An Intermediate Regional Flood (IRF) is projected to crest 2.6 feet higher than the June 1905 flood. The rarer Standard Project Flood would have a discharge nearly four times that of an IRF causing severe damage. This report was prepared to aid in the solution of local flood problems and the best utilization of land subject to periodic overflow. (Salzman-North Carolina)
W75-00547

FLOOD PLAIN INFORMATION, CUMBERLAND RIVER AND STRAIGHT CREEK, PINEVILLE, KENTUCKY.
Army Engineer District, Nashville, Tenn.
Prepared for the City of Pineville, Kentucky, August, 1973. 44 p, 14 fig, 5 tab, 13 plates.

Descriptors: *Floodings, *Flood control, *Flood protection, *Kentucky, Historic floods, Floodplains, Dams.
Identifiers: Pineville(Ky), *Straight Creek(Ky), *Cumberland River(Ky).

Portions of Pineville in Bell County and vicinity are subject to flooding produced by intense rainfalls that accompany severe storm fronts with water out of banks for 24 to 36 hours along the Cumberland River. Flood plain of the river averages 700 feet in width, the channel is about 300 feet wide and banks are generally 20-30 feet above stream bed. In Pineville the floodplain is as broad as 1700 feet. The creek is similar on a smaller scale. Much of the floodplain is developed and includes Pineville's business district, municipal buildings, the community hospital, residential and limited industrial development. Major floods occur in late winter or early spring. Floods on Straight Creek remain out-of-banks for a shorter period. Local flood protection provides a system of levees and floodwalls which are only 2 feet above the maximum stage of the largest flood on December 31, 1969, which crested at 1017.5 feet. The most recent flood, March 17, 1973, crested at 1011.6 feet. Two dam projects upstream would protect against an Intermediate Regional Flood (IRF), expected to crest at 1021.6 feet on the Cumberland River, but have no effect in a Standard Project Flood (SPF). A SPF's elevation of 1031.4 feet would rise 11.7 feet above the levee and would cause extensive damage. This report furnishes a basis for the adoption of land use regulations to guide floodplain development. (Salzman-North Carolina)
W75-00548

FLOOD PLAIN INFORMATION, LEMON CREEK, JUNEAU, ALASKA,
Army Engineer District, Juneau, Alaska.
Prepared for the Greater Juneau Borough, Alaska. March, 1971. 22 p, 4 fig, 3 tab, 11 plates.

Descriptors: *Flooding, *Flood plain, *Flood protection, *Flood control, Flood damage, *Alaska.
Identifiers: Juneau(Alaska), *Lemon Creek(Alaska).

Located 4.8 miles northwest from Juneau, Alaska, Lemon Creek is centrally situated with respect to a large block of timber, the Tongass National Forest. An additional development in this area incorporating land for Juneau's expanding economy would encroach on the floodplains because the higher flood-free areas have been developed. The main flooding occurs August through November resulting from rainfall with a base flow. There also is a period of high water every spring caused by melting snow. Thirty percent of Lemon Creek's watershed is covered by glaciers. Elevations in the drainage basin range from sea level to over 6,000 feet creating steep stream slopes. Velocity of water during major floods ranges up to 19 feet per second in the channel. During a flood, a very rapid rise to 30 feet would be followed by a relatively slow rise because of the relief afforded by the large overbank area. A stream gage installed in 1954, local interviews and historical documents provided information. The greatest flood probably has not been recorded. A known flood in September 1927 was as severe or worse than later floods. The most recent flood occurred on September 14, 1967. An Intermediate Regional Flood would have a surface elevation of 32.5 feet and a Standard Project Flood, 35.1 feet, though no known flood has ever reached these levels. With uncontrolled development in the floodplains it is likely that future floods will cause extensive damage. The report provides the basis for future study and planning in arriving at solutions to minimize vulnerability to flood damage. (Salzman-North Carolina)
W75-00549

FLOOD PLAIN INFORMATION: FARMINGTON BAY TRIBUTARIES, FARMINGTON-CENTERVILLE, UTAH,
Army Engineer District, Sacramento, Calif.
Prepared for Davis County, June 1974, 50 p, 23 fig, 6 tab, 18 plates.

Descriptors: *Flood forecasting, *Floodplains, *Flood damage, *Flood profiles, *Utah, Great Salt Lakes, Historic floods, Flood stages, Obstruction to flow, Land use, Planning, Cloudbursts, Sheet flow.
Identifiers: *Farmington Bay tributaries(Utah), *Farmington Creek, Farmington(Utah), Centerville(Utah), Steed Creek, Ricks Creek, Parrish Creek, Deuel Creek, Floodplain management, Mass-debris flow, Intermediate Regional Flood, Standard Project Flood.

The floodplain, subject to flooding from Farmington, Steed, Ricks, Parrish, and Deuel Creeks, all tributaries of Farmington Bay and an arm of Great Salt Lake, is mostly agricultural and rural-residential, with some commercial development in Farmington and Centerville, Utah. During the next 25 to 30 years, and land use patterns are not expected to change radically. The stream channels are small and poorly defined, Farmington Creek is the only one to maintain a definite channel to Farmington Bay. Many obstructive bridges, culverts, and drop and diversion structures block flood flow which is most often caused by summer cloudbursts producing intense rainfall and mass-debris flow which has great destructive and transportive power. Newspaper accounts and eye-witness descriptions report that the floods of Aug. 1923 and summer 1930 from cloudbursts are the most damaging known. Of all the creeks, Farmington has the highest projected peak discharge: 2300 cfs in an Intermediate Regional Flood (IRF) and 3900 cfs in a Standard Project Flood (SPF). Most flooding would be sheet flow in nature and of short duration. The area inundated by an IRF on the tributaries totals about 3260 acres and would have devastating damage. Some flood damage reduction measures, comprising revegetation, terracing, construction of basins and dikes to restrain mass-debris, undertaken by the U.S. Forest Service have diminished flood flows, but are not adequate to decrease peak discharge of an IRF or SPF. Along with the flood control master plan of Cen-

terville done in 1972, this study provides a basis to guide land development toward optimum uses commensurate with flood hazard. (Diefendorf-North Carolina)
W75-00550

4B. Groundwater Management

INFLUENCE OF BOUNDARY RESISTANCE ON MEASUREMENTS OF UNSATURATED HYDRAULIC CONDUCTIVITY WITH THE DOUBLE MEMBRANE PRESSURE APPARATUS, (IN GERMAN),
Niedersaechsisches Landesamt fuer Bodenforschung, Hanover (West Germany).
For primary bibliographic entry see Field 2F.
W75-00121

THE USE OF ARTIFICIAL RADIOACTIVE TRACERS FOR THE SOLUTION OF HYDROLOGICAL PROBLEMS (DIE VERWENDUNG KUENSTLICHER RADIOAKTIVER MARKIERUNGEN ZUR LOESUNG HYDROLOGISCHER PROBLEME),
For primary bibliographic entry see Field 2F.
W75-00163

THE SIGNIFICANCE OF ISOTOPIC MEASUREMENTS FOR COMBINED KARST WATER STUDIES (DIE BEDEUTUNG VON ISOTOPENMESSUNGEN IM RAHMEN KOMBINIERTER KARSTWASSERUNTERSUCHUNGEN),
For primary bibliographic entry see Field 2F.
W75-00164

THE USE OF ARTIFICIAL RADIOACTIVE TRACERS FOR THE SOLUTION OF HYDROLOGICAL PROBLEMS. PART I: METHODS (DIE VERWENDUNG KUENSTLICHER RADIOAKTIVER MARKIERUNGEN ZUR LOESUNG HYDROLOGISCHER PROBLEME. TEIL I: METHODIK),
For primary bibliographic entry see Field 2F.
W75-00165

CONSIDERATIONS ON ARTIFICIAL GROUNDWATER RECHARGE (NACHDENKLICHES ZUR KUENSTLICHEN GRUNDWASSERANREICHERUNG),
R. Bettaque.
Gas-Wasser-Fach--Wasser/Abwasser, Vol 115, No 4, p 171-173, April, 1974. 39 ref.

Descriptors: *Groundwater recharge, *Artificial recharge, *Potable water, *Water supply, Infiltration, Anaerobic conditions, Water works, Organic matter, Biodegradation, Water treatment.
Identifiers: *West Germany, *Biological filtration.

The advantages of artificial groundwater recharge as a means of obtaining drinking water supply are described with respect to a reluctance towards the application of this process to water supply in West Germany. Uncertainties concerning the suitability of various grounds for infiltration, and the frequent failures of this process due to established anaerobic conditions resulting from high pollutant loads and inadequate operating conditions have led to the abandonment of the infiltration technique at many water works. However, the biological slow filtration is superior to chemical and physical methods of drinking water preparation in its capacity to degrade organic matter. This capacity amounts to about 75 percent, corresponding to a residual oxidizability of 1-2 mg/liter, against 50 percent determined for the flocculation process. The biologically stable water obtained by the biological filtration impedes the proliferation of microorganisms in the water mains. Raw waters with high pollutant loads require preliminary purification, such as by rapid filtration and flocculation to prevent anaerobic conditions. (Takacs-FIRL)
W75-00166

TESTING OF METHODS FOR DETERMINATION OF URBAN RUNOFF,
Dalton-Dalton-Little-Newport, Inc., Cleveland, Ohio.
For primary bibliographic entry see Field 4A.
W75-00212

GROUND-WATER CONDITIONS IN UTAH, SPRING OF 1974,
Geological Survey, Salt Lake City, Utah.
For primary bibliographic entry see Field 2F.
W75-00225

THE WATERS OF HOT SPRINGS NATIONAL PARK, ARKANSAS--THEIR ORIGIN, NATURE, AND MANAGEMENT,
Geological Survey, Little Rock, Ark.
For primary bibliographic entry see Field 2F.
W75-00231

SUMMARY OF THE GROUND-WATER RESOURCES OF THE JAMES RIVER BASIN, VIRGINIA,
Geological Survey, Richmond, Va.
W. F. Lichtler, and R. L. Wait.
Open-file report 74-139, July 1974. 54 p, 10 fig, 2 tabs, 18 ref.

Descriptors: *Groundwater, *Virginia, *Water resources, Hydrologic data, Water yield, Hydrogeology, Groundwater basins, River basins, Planning.
Identifiers: *James River basin(Va).

The groundwater resources of the James River basin in central Virginia are summarized. Springs are abundant in the Paleozoic rocks of the Valley and Ridge province. Most of the large springs, some of which yield as much as 7,000 gallons per minute, emanate from solution channels and fractures in carbonate rock or sandstone. Well yields range from less than 10 to more than 1,000 gallons per minute; the larger yields usually are found in formations that also contain the larger springs. Wells located at the intersection of fractures also usually have large yields. Discharge or groundwater to streams is estimated to be 100,000 to 300,000 gpd per square mile. Most wells in metamorphic rocks of the Blue Ridge and Piedmont provinces obtain most of their water within a depth of 200 feet. Wells drilled in draws usually have larger yields than wells drilled on hilltops. Rocks of Triassic age are present in small isolated basins in the Piedmont. Moderate yields are obtained from sandstone or conglomerate layers. Coastal Plain sediments of Early Cretaceous age consist of thick alternating beds of sand and clay of continental origin. Quartz sand beds more than 30 feet thick are common, and some are more than 100 feet thick. Some multiscreen wells yield more than 2,000 gpm. Total pumpage from aquifers within the James River basin is estimated to have been more than 68 million gpd in 1971. The quality of the water in Lower Cretaceous sediments ranges from soft water of low mineral and bicarbonate content near the Fall Line through hard calcium bicarbonate water of moderate mineral content in the west-central part of the area to soft sodium bicarbonate water of moderate to high mineral content in the eastern parts. (Knapp-USGS)
W75-00236

TEMPORARY DETENTION OF STORM AND COMBINED SEWAGE IN NATURAL UNDERGROUND FORMATIONS,
For primary bibliographic entry see Field 5D.
W75-00274

NORTH FORK ALLUVIAL DECONTAMINATION PROJECT, HUBBARD CREEK RESERVOIR WATERSHED,
West Central Texas Municipal Water District, Abilene.
For primary bibliographic entry see Field 5G.
W75-00275

TRITIUM HYDROLOGY STUDIES IN CALIFORNIA,
California Univ., Los Angeles. Dept. of Chemistry; and California Univ., Los Angeles. Inst. of Geophysics.
For primary bibliographic entry see Field 7B.
W75-00277

MONITORING TOXIC CHEMICAL POLLUTION FROM LAND DISPOSAL SITES IN HUMID REGIONS,
Illinois State Water Survey, Urbana.
For primary bibliographic entry see Field 5B.
W75-00317

TOTAL DISSOLVED SOLIDS IN GROUND WATER OF THE WAINWRIGHT AREA, ALBERTA,
Research Council of Alberta, Edmonton.
For primary bibliographic entry see Field 5B.
W75-00321

TWO-DIMENSIONAL FINITE ELEMENT MODELING OF TRANSIENT FLOW IN REGIONAL AQUIFER SYSTEMS - ANALYSIS OF GROUNDWATER FLOW IN RELATION TO WATER QUALITY IMPROVEMENT,
Michigan State Univ., East Lansing. Dept. of Civil Engineering.
For primary bibliographic entry see Field 5B.
W75-00426

4C. Effects On Water Of Man'S Non-Water Activities

LABORATORY STUDY OF EFFECTS OF ENVIRONMENT AND CONSTRUCTION PROCEDURES ON CONCRETE PAVEMENT SURFACES,
Texas Transportation Inst., College Station.
For primary bibliographic entry see Field 8F.
W75-00102

HEAVY METALS AND OTHER TRACE ELEMENTS,
Illinois Univ., Urbana.
H. V. Leland, E. D. Copenhaver, and L. S. Corrill.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1452-1576, June, 1974. 257 ref.

Descriptors: *Aquatic environments, *Public health, *Water pollution, *Heavy metals, Trace elements, Hematology.

Trace elements like heavy metals are natural constituents of aquatic environments. If more of the elements are added to water through the activities of humans and result in changed chemical composition of the environment, the natural cycling processes are upset. Mine wastes contribute to such an imbalance, along with many waste water treatment plants and heavy metal particles from smelters and other industrial processes. Some elements present at trace concentrations have been determined dangerous and extremely toxic at unnatural exposure concentrations. A possible relationship has been shown between concentration of some waterborne trace elements and dental caries. Chronic poisoning due to As was reported in Argentina. Cd intoxication has been determined to result in kidney failure. Methylmercury poisoning

was reported in epidemic proportions in Iraq in 1972. Analyses of specific parameters for determining the condition of health of aquatic organisms has been recommended. Hematological alterations are multiplied when there is the introduction of sublethal concentrations of toxic metals in aquatic environments. (Leibowitz-FIRL)
W75-00198

TESTING OF METHODS FOR DETERMINATION OF URBAN RUNOFF,
Dalton-Dalton-Little-Newport, Inc., Cleveland, Ohio.
For primary bibliographic entry see Field 4A.
W75-00212

AN ANALYSIS OF STRIP MINING METHODS AND EQUIPMENT SELECTION,
Pennsylvania State Univ., University Park. Dept. of Mineral Engineering.
For primary bibliographic entry see Field 5G.
W75-00233

AIRPORTS, SUBDIVISIONS AND SURFACE WATERS,
Ohio Northern Univ., Ada. Coll. of Law.
For primary bibliographic entry see Field 6E.
W75-00302

EFFECT OF CUTTING DOWN SHORE TREES ON THE INTENSITY OF WATER MOVEMENTS IN A LAKE, (IN POLISH),
Wyzsza Szkola Rolnicza, Olsztyn-Kortowa (Poland). Instytut Hydrobiologii Ochrany Wodnego.
P. Olszewski.
Acta Hydrobiol, Vol 15, No 2, p 131-143, 1973, Illus. English summary.

Descriptors: *Lakes, Hypolimnion, Trees, Thermocline, Water circulation, Clear-cutting, Lakes.

An attempt was made to check the theory that trees surrounding a lake, and thus protecting it from the wind, cause a decrease in the mobility of the waters in the lake. A lake was investigated for 5 yr before and after 5 yr cutting down shore trees. No noticeable differences in the intensity of the spring circulation, temperatures of the hypolimnion, deeper shifting of the thermocline or other properties supporting the above were observed. Variabionts of these properties were considerable before and after cutting down shore trees and were due to meteorological conditions.--Copyright 1974, Biological Abstracts, Inc.
W75-00338

5. WATER QUALITY MANAGEMENT AND PROTECTION

5A. Identification Of Pollutants

A THERMAL WAVE FLOWMETER FOR MEASURING COMBINED SEWER FLOWS,
Hydrospace-Challenger, Inc., Rockville, Md.
For primary bibliographic entry see Field 5B.
W75-00006

OIL SPILL SURVEILLANCE SYSTEM STUDY,
Texas Instruments, Inc., Dallas, Tex.
D. Mohr, K. McCormack, G. Brewster, and G. Fournier.
Copy available from GPO Sup Doc as EP1.23/2:73-215, $2.60; microfiche from NTIS, Springfield, Va. 22161, as PB-227 364 $2.25. Environmental Protection Agency, Technology Series, Report EPA-R2-73-215, May 1973. 215 p, 147 fig, 19 tab, 8 ref. EPA Project 15080 HOP. 68-01-0150.

Descriptors: *Oil wastes, *Pollutant identification, *Infrared radiation, *Instrumentation, *Remote sensing, *Oil spills, Oil pollution.
Identifiers: Spill detection, Active infrared, Passive infrared.

Tests of active and passive infrared sensor systems were conducted to determine the ability of these systems to detect petroleum oil on water. Since there are temperature and emissivity differences between oil and water it was expected that these systems would have applications for real time detection, alarm, monitoring, and recording of oil spilled or discharged in harbors, lakes, rivers, estuaries and coastal waters. Both sensors had distinct advantages. The active sensor provided absolute oil spill detection for ranges to 300 feet. The passive sensor makes possible oil volume determination, areal coverage, and probable oil detection for ranges to 1000 feet. Since both sensors have distinct advantages, a combination of the two is recommended. (EPA)
W75-00007

SPECTRAL REFLECTANCE OF WATER CONTAINING SUSPENDED SEDIMENT,
Agricultural Research Service, Chickasha, Okla. Southern Great Plains Watershed Research Center.
For primary bibliographic entry see Field 2J.
W75-00104

DETERMINATION OF ZINC AND CADMIUM IN ENVIRONMENTALLY BASED SAMPLES BY THE RADIOFREQUENCY SPECTROMETRIC SOURCE,
Oak Ridge National Lab., Tenn.
Y. Talmi.
Analytical Chemistry, Vol 46, No 8, p 1005-1015, July, 1974. 1 fig, 5 tab, 16 ref.

Descriptors: *Spectrometry, *Cadmium, *Zinc, Environmental effects, Analytical techniques, Sampling, *Pollutant identification.
Identifiers: *Radiofrequency furnace, *Atomic absorption, *Atomic emission.

The applicability of the radiofrequency furnace (RFF) spectrometric source to the analysis of trace amounts of cadmium and zinc in environmental samples is described. Modifications in the original design of the system enhanced sensitivity and reduced interferences. Both atomic absorption (AA) and atomic emission (AE) spectrometric modes have been sucessfully used with samples pre-treated by various methods. These included wet ashing, on-substrate wet ashing and Soluence solubility, and direct analysis. Samples such as coal, fly ash, gasoline, bovine liver, bunker oil, soil, orchard leaves, and fish gonad were analyzed. The rate of analysis was five per minute. The average overall accuracy was 6.8 percent and reproducibility was 5.5 percent. With the AA mode, detection limits for Cd and Zn were 5 picograms and 6 and 8 picograms with the AE mode. Relative sensitivities were in the 0.001-0.5 ppm range. Interferences in the two modes were also compared. (Prague-FIRL)
W75-00107

WATER POLLUTION TELEMETRY SYSTEM (IN JAPANESE),
S. Kitahara, K. Takeno, and A. Omura.
Mitsubishi Denki Giho, Vol 48, No 4, p 452-458, April 1974. 5 fig, 4 tab, 6 ref. (English summary).

Descriptors: *Telemetry, *Water quality standards, *Water quality control, *Water pollution, Measurement, Systems, Urbanization, Rivers, Lakes, Municipal water.
Identifiers: *Japan.

Waste water produced by industries and urban expansion is on the increase and pollution of water of rivers and lakes around cities is being aggravated. A water pollution telemetry system was built for the purpose of studying the water pollution. The Ministry of Construction (of Japan) tries to standardize the specifications of water pollution telemeters and has given more stringent standards for the water quality. (Prague-FIRL)
W75-00108

DDT RESIDUES IN SOIL, WATER, AND FAUNA FROM NEW YORK APPLE ORCHARDS,
New York State Agricultural Experiment Station, Geneva. Dept. of Entmology.
For primary bibliographic entry see Field 5B.
W75-00109

SOME IMPLICATIONS OF THE PHOTOCHEMICAL DECOMPOSITION OF PESTICIDES,
Bristol Univ., Long Ashton (England). Agricultural and Horticultural Research Station.
D. A. M. Watkins.
Chemistry and Industry, Vol 2, No 5, p 185-190, March, 1974. 5 fig, 1 tab, 46 ref.

Descriptors: *Pesticides, *Photometry, Irradiation, Dieldrin, DDT, Carbamate pesticides, Heptachlor, Acids, Fungicides, *Photosynthesis, *Decomposing organic matter.
Identifiers: Dichlofuanid, Dinitrophenols, Dithiocarbamates.

The emphasis in the study of light effects on pesticides has changed from observing that an effect occurs, through a phase of identifying products in an artificial system, to investigating the effect in various environmental conditions such as soil, water, and air. Interest is also being shown in the effect of photosensitizers and in the photonucleophilic reactions of pesticides with other compounds present in the environment. A discussion of a representative selection of pesticides is given with the emphasis on the vapor work that has been reported and also on breakdowns which give volatile or gaseous products. (Sandoski-FIRL)
W75-00117

STUDY ON SUBACUTE TOXICITY OF CARBON N-HEXANE-ACETONE EXTRACT RECOVERED FROM DRINKING WATER,
Kyoto Municipal Hygienic Lab. (Japan).
For primary bibliographic entry see Field 5C.
W75-00120

BOD: A RE-EVALUATION,
Las Cruces Wastewater Treatment Plant, N. Mex.
D. W. Clark.
Water and Sewage Works, Vol 121, No 5, p 68-69, May, 1974. 9 ref.

Descriptors: *Biochemical oxygen demand, *Chemical oxygen demand, *Analytical techniques, Waste water treatment, Water analysis, Treatment facilities, Operations, *Reviews, Pollutant identification, Carbon.
Identifiers: *Total organic carbon.

There is growing dissatisfaction with the standard five-day biochemical oxygen demand (BOD) determination as a basic control parameter for wastewater treatment plant operation. Limitations associated with BOD include: the length of time it takes for test analysis, difficulties in correlating results with observed conditions, and uncertainty as to what is actually being measured. Chemical oxygen demand (COD) testing was an attempt to improve upon the speed and precision of the BOD. It utilizes dichromate to oxidize the organic materials under harsh conditions. The COD includes not only carbonaeceous oxygen demand, but other forms as well. Total organic carbon (TOC) analysis improved upon organic and inorganic source differentiation by measuring a different parameter. It does not rely upon oxygen de-

mand; rather it measures the carbon dioxide produced upon complete oxidation of the organic material in the waste. By using BOD, COD, and TOC results, a descriptive profile of a waste can be accumulated which include the specific concentrations of organics in the waste, the rate at which these organics will be decomposed, the oxygen required to do this, and finally the portion of organic material which will remain inert. (Sandoski-FIRL)
W75-00123

THE FATE OF PHENOLICS IN WASTEWATER - DETERMINATION BY DIRECT-INJECTION GLC AND WARBURG RESPIROMETRY,
Los Angeles County Sanitation District, Whittier, Calif. San Jose Creek Water Quality Lab.
For primary bibliographic entry see Field 5B.
W75-00130

DEVELOPMENT OF A SIMPLE AND INEXPENSIVE METHOD FOR THE DETERMINATION OF ORGANICALLY BOUND CHLORINE ON ACTIVATED CARBON IN WATERWORKS FILTERS (ENTWICKLUNG EINER EINFACHEN UND BILLIGEN METHODE ZUR BESTIMMUNG VON ORGANISCH GEBUNDENEN CHLOR AUF AKTIVKOHLE VON WASSERWERKSFILTERN),
E. Mainka, W. Coerdt, A. von Baeckmann, and W. Kuehn.
Gas-Wasser-Fach - Wasser/Abwasser, Vol 115, No 4, p 178-181, April, 1974. 2 tab, 2 fig, 9 ref.

Descriptors: *Activated carbon, *Adsorption, *Chlorine, Pesticides, Filters, Water works, Aluminum, Hydropyrolysis, Analytical techniques, *Pollutant identification, *Chlorinated hydrocarbon pesticides.
Identifiers: *Organochlorine substances.

A simple, inexpensive procedure for the determination of organochlorine substances, including pesticides, adsorbed on activated carbon in water works filters, is described. The activated carbon samples, to be stored deep-frozen in aluminum containers to prevent adsorption, are washed with twice distilled water for the desorption of inorganic chlorides, after which the sample is dried at 60C for 48 hrs, and then milled for homogenization. The organic chlorine is then released by hydropyrolysis at temperatures of up to 1,000C in water vapor-saturated oxygen stream. The test solution is then combined with twice distilled water, and thermostatized at 25C for the determination of organically bound chlorine by means of an ion-specific chloride electrode, using a double-junction reference electrode as counter-electrode. The potential is changed by the addition of a standard solution with known chlorine concentration. (Takacs-FIRL)
W75-00156

AERIAL INFRARED THERMOGRAPHY IN THE SERVICE OF WATER PROTECTION: AN EXAMPLE: THE CASE OF CHARENTE (LA THERMOGRAPHIE INFRAROUGE AEROPORTEE AU SERVICE DE LA PROTECTION DES EAUX: UN EXEMPLE: LE CAS DE LA CHARENTE),
C. Dechambenoy, L. Pontier, F. Sirou, J. Vouve, and E. Pouget.
Techniques et Sciences Municipales, Vol 69, No 4, p 175-185, April, 1974. 12 fig, 4 ref.

Descriptors: *Water pollution sources, *Thermal pollution, Thermal water, Temperature, Flow measurement, Effluents, Automation, Analytical techniques, *Pollutant identification.
Identifiers: *Thermography, *Radiometers, *Infrared radiometers, *France(Charente River), Aerial thermography.

The thermal pollution of the Charente river in France was studied by aerial infrared thermography, using an infrared radiometer with a rotary mirror for scanning at 500 m altitude. The temperatures recorded on magnetic tape are displayed either in the form of temperature listing for automatic data processing, or in the form of coded listing for the study of details. The presence of thermal anomalies in the waterflow can be indicative of flow anomalies, thermal pollution, and subsurface obstacles. The purified effluent from a waste water treatment plant was detected as a homogeneous cloud with a temperature slightly above the mean water temperature of the river. (Takacs-FIRL)
W75-00157

THE GEOPHYSICAL BEHAVIOR OF THE ENVIRONMENTAL ISOTOPES AS A BASIS FOR MODEL CALCULATIONS IN ISOTOPIC HYDROLOGY (DAS GEOPHYSIKALISCHE VERHALTEN DER UMWELTISOTOPE ALS BASIS FUER MODELLRECHNUNGEN IN DER ISOTOPENHYDROLOGIE),
For primary bibliographic entry see Field 5B.
W75-00158

THE DETERMINATION OF RESIDUAL CHLORINE IN WATERS (LA DETERMINAZIONE DEL CLORO RESIDUO NELLE ACQUE),
P. Bodrito.
Inquinamento, Vol 16, No 3, p 26-28, March, 1974. 2 fig, 1 tab, 11 ref.

Descriptors: *Chlorine, *Colorimetry, Analytical techniques, Nitrites, Iron, *Pollutant identification, Water analysis.
Identifiers: Residual chlorine, Chloramines, Hydrochloric acid.

A colorimetric method for the determination of chlorine in water by means of o-tolidine is described. The total chlorine content is measured by the addition of one ml o-tolidine to 50 ml water. The sum of chlorine, hydrochloric acid, and chlorine dioxide is determined by the additional use in the test solution of arsenite for the prevention of the color reaction of the chloramines. The interference by free chlorine and chloramines is prevented by the addition of malonic acid. The colorimetric method has a sensitivity of 0.02-0.05 ppm. The interference by iron is prevented by preliminary precipitation by sodium pyrophosphate. The nitrite content in the test solution should be less than 2 ppm for no interference to occur. (Takacs-FIRL)
W75-00159

DETERMINATION OF INORGANIC POLLUTANT CATIONS BY THIN-LAYER CHROMATOGRAPHY (DETERMINAZIONE DI CATIONI INORGANICHI INQUINANTI MEDIANTE CHROMATOGRAFIA SU STRATO SOTTILE),
R. Frache, M. Drago, and P. Cescon.
Inquinamento, Vol 16, No 3, p 23-25, March, 1974. 1 fig, 16 ref.

Descriptors: *Chromatography, *Inorganic compounds, Water pollution sources, Metals, Analytical techniques, Sampling, *Ion exchange, Cellulose, *Pollutant identification, *Cations.
Identifiers: *Thin-layer chromatography, Inorganic cations.

Thin-layer chromatographic method for the determination of inorganic cations as water pollutants, such as bivalent mercury, zinc, cadmium, nickel, copper, manganese, lead and barium ions, and trivalent iron and chromium ions is described. The samples to be analyzed are first concentrated on nitric acid-treated 20-50 mesh Dowex 50WX8 ion exchange resin. Silicagel, alumina, and cellulose can be used as thin layer, while the best results were obtained by means of microcrystalline cellulose layer of 400 micron thickness. A 40:40:20:20 ratio of acetone, butanol, 0.4N hydrochloric acid and water is used as eluent. (Takacs-FIRL)
W75-00160

MERCURY DETERMINATION IN WATER AND WASTE WATER BY FLAMELESS ATOMIC ABSORPTION (QUECKSILBER-BESTIMMUNG IN WASSER UND ABWASSER MIT HILFE DER FLAMMENLOSEN ATOMABSORPTION),
Beckman Instruments G. m. b. H., Munich (West Germany).
M. Dujmovic, and H. A. Winkler.
Chemiker-Zietung, Vol 98, No 5, p 233-235, May, 1974. 4 fig, 1 tab, 8 ref.

Descriptors: *Mercury, *Spectroscopy, Analytical techniques, Waste water, Water pollution sources, Ultraviolet radiation, *Pollutant identification.
Identifiers: *Flameless atomic absorption spectroscopy.

Flameless atomic absorption spectroscopy has been shown as a suitable method for the determination of mercury in water. Organic bound mercury must be exposed to ultraviolet radiation before its determination. The reliability of the method was tested by application to different types of water. An analytical differentiation between inorganic and organic bound mercury was shown. (Prague-FIRL)
W75-00161

GEL- AND ULTRAMEMBRANE FILTRATION OF AQUATIC HUMUS: A COMPARISON OF THE TWO METHODS,
Institut for Vannforskning, Blindern.
E. T. Gjessing.
Swiss Journal of Hydrology, Vol 35, No 2, p 286-294, 1973.

Descriptors: *Fractionation, *Filtration, Aquatic plants, Aquatic life, *Humus, Desalting, *Analytical techniques, Water chemistry, *Pollutant identification, Waste water treatment.
Identifiers: *Ultramembrane filtration, *Gel filtration(Sephadex), Aquatic humus.

Analytical water chemistry methods are discussed. Fractionation as an approach for obtaining information about the complex composition of aquatic humus is detailed. For this purpose, gel filtration has been used over the last decade. More recently ultramembrane filtration as a technique of fractionation has been found useful. The two techniques are compared and results of combined use of ultramembrane filtration and gel filtration are reported. The results show a poor correspondence regarding molecular size. Due to an interaction between the gel used (Sephadex) and humus, the ultra-membrane filtration technique proved to be preferable for desalting and for molecular size fractionation of aquatic humus. (Prague-FIRL)
W75-00162

THE APPLICATION OF SOME ELECTROCHEMICAL METHODS TO THE MEASUREMENT OF PHOTOSYNTHESIS AND RESPIRATION IN FRESH WATERS,
Freshwater Biological, Association, Ambleside, (England).
J. F. Talling.
Freshwater Biol. Vol 3, No 4, p 335-362, 1973. Illus.

Descriptors: Photosynthesis, Respiration, *Freshwater, Measurement, *Chemical analysis, *Analytical techniques, Alkalinity, Oxygen, Carbon dioxide, Oxides, *Pollutant identification.
Identifiers: Titrations, Winkler method.

Potentiometric or amperometric measurments with appropriate electrode systems are described, adapted to the rapid estimation of small changes of CO2 or O2 content in natural waters. Total CO2 can be estimated from potentiometric (pH) titra-

tions with 6 readings, with a graphical Gran transformation; in some instances 3 readings/sample are sufficient for the estimation of CO2 changes. The results can be used to calibrate the relationship between pH, alkalinity, and temperature, which is then available for the calculation of CO2 changes from pH changes. Deviations from the 'theoretical' behavior of simple carbonate solutions are probably widespread in alkaline freshwaters. A semiempirical method of matching them by a postulated alkalinity component is outlined. The same factors are used to evaluate the buffer intensity with respect to CO2 changes at constant alkalinity. Graphs are derived from which the concentration of total CO2 and the buffer intensity can be rapidly estimated. The use of pH-stat conditions to follow changes of CO2 by titrant consumption is also described, with examples involving photosynthesis by phytoplankton. Several procedures are given for estimating dissolved O2 with the Winkler method followed by amperometric titration with a simple Pt-calomel combination electrode. No externally applied potential is required and both forward and back titrations past the end-point can be followed by calculation of the latter from a few readings. Alternatively, titration to a small fixed electrode current (or derived potential) is a practicable method. The titration procedures can be adapted to macro- and micro-estimations, used with pH-estimations, used with pH-meters as current detectors and automated.--Copyright 1974, Biological Abstracts, Inc.
W75-00171

METHOD AND APPARATUS FOR DETECTING PARTICULATE MATERIAL IN FLOW STREAM,
Mobil Research and Development Corp., New York City. (Assignee).
For primary bibliographic entry see Field 2J.
W75-00178

SYSTEM FOR MEASURING BOD BY ELECTROLYSIS,
Iowa State Univ. Research Foundation, Inc., Ames.
J. C. Young.
Canadian Patent 947,819. Issued May 21, 1974. Patent Office Record, Vol 102, No 21, p 79, May, 1974.

Descriptors: *Patents, *Measurement, *Biochemical oxygen demand, *Electrolysis, *Pollutant identification.

A reaction vessel containing the sample receives a container of material for absorbing CO2 which is provided with an adaptor. An electrolysis cell storing the electrolyte is received in the adaptor. A cap is placed on the electrolysis cell with an upper circular covering flange spaced from the walls of the cell thus providing an annular space communicating with the electrolyte. This permits venting of hydrogen while minimizing evaporation of the electrolyte. When the level of the electrolyte falls below a predetermined minimum, indicating a low 02 pressure in the vessel, a sensing switch energizes a regulated DC current source to start the electrolysis process to replace the 02 consumed by the sample. The system is insensitive to changes in line voltage and electrolyte strength over a design range. Apertures in the cap member and the cell may be selectively aligned by twisting the cap to equalize the pressure in the cell with atmospheric pressure before starting. (Sandoski-FIRL)
W75-00186

ORGANICS,
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
For primary bibliographic entry see Field 5B.
W75-00194

LONG-TERM VARIABILITY IN THE STRUCTURE OF SUBTIDAL BENTHIC COMMUNITIES IN PUDGET SOUND, WASHINGTON, USA,
For primary bibliographic entry see Field 2L.
W75-00195

WATER CHARACTERISTICS,
Maine Univ., Orono.
M. M. Ghosh, and W. P. Brown.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1050-1058, June, 1974. 72 ref.

Descriptors: *Analytical techniques, *Reviews, Monitoring, Measurement, Methodology, Equipment, Laboratory tests.
Identifiers: *Water characteristics.

Considerable attention was focused in 1973 on the development and refinement of analytical techniques for determination of various water characteristics. Monitoring and measurement methods and equipment for analysis of parameters such as temperature, suspended solids, hydrogen ion concentration, electrolytic resistivity, polybasic acids activity coefficients, and turbidity, are reviewed. (Sandoski-FIRL)
W75-00197

MICROBIOLOGY: DETECTION, OCCURRENCE, AND REMOVAL OF VIRUSES,
National Environmental Research Center, Cincinnati, Ohio.
G. Berg.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1408-1413, June, 1974. 35 ref.

Descriptors: *Microbiology, *Viruses, *Water pollution, Waste water treatment, Adsorption, Biological treatment.
Identifiers: Epoxy-fiberglass filters, Nitrocellulose filters, Physico-chemical treatment.

The virus concentrator lends itself to monitoring water reclamation plants for the determination of their efficiency in the inactivation and removal of viruses. Acidification of clean water which passes through the concentrator permits efficient adsorption of viruses onto epoxy-fiberglass and nitrocelulose filters. HC1 acidifies the water before passing through a virus adsorber. Adsorbed viruses are eluted with one liter of pH 11.5 elutant, then reconcentrated by adsorption to an elution from an epoxy-fiberglass filter. Small amounts of poliovirus I in 100 gallons of tap water concentrated almost 40,000 fold. A 77 percent virus recovery efficiency was reached. Filtration of virus-seeded water through asbestos filters filled with sodium alginate and subsequent concentration of the virus onto La-Al-alginate soluble ultrafilters achieved a total recovery of the virus. Well water, waste water, and rivers and lakes, as well as vegetables grown on virus-laden soil were the sites of recovery. Virus may also be removed from waste water by biological and chemico-physical treatment methods. (Leibowitz-FIRL)
W75-00199

DICTIONARY OF THE NATIONAL WATER QUALITY DATA BANK (NAQUADAT).
Department of the Environment, Ottawa (Ontario).
For primary bibliographic entry see Field 7C.
W75-00224

A SURVEY OF ORGANIC CARBON CONSTITUENTS IN NATURAL FRESH WATERS,
Dept. of Civil and Mineral Engineering. Minnesota Univ., Minneapolis.
W. J. Maier, H. L. McConnell, and L. E. Conroy.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 794, $3.25 in paper copy, $2.25 in microfiche. Mimeographed Report, 1974. 10 p, 4 tab. OWRT A-030-MINN(1).

Descriptors: *Carbon, *Carbon cycle, Water supply, *Minnesota, *Pollutant identification, Lake Superior, Seasonal, Water pollution sources, Path of pollutants, Mississippi River.
Identifiers: *Organic carbon, Pollution index.

A one year test program to determine organic and inorganic carbon concentrations in Minnesota's major bodies of water has been carried out. Carbon contents were measured using a modified Beckman Carbon Analyzer. All natural waters contain substantial amounts of organic carbon; concentrations in the major Minnesota river basins range from 7 to 45 mg/l with a mean of 22 mg/l; Lake Superior is the exception and has about 5 mg/l in the near shore areas. River waters show marked seasonal variations; lowest organic carbon concentrations are generally observed during high flow conditions in April and in January for some streams; highest concentrations generally occur in the July-August period but some streams show equally high peaks in December. Seasonal variations in organic carbon loading (mass) mirror seasonal variations in flow. This dependence on flow volume suggests that the bulk of the organics derive from natural sources. However, urbah and industrial inflows appear to be significant factors at several locations. (Walton-Minnesota)
W75-00271

DETERMINATION OF SUBMICROGRAM QUANTITIES OF MONOMETHYL MERCURY IN AQUATIC SAMPLES,
Cornell Univ., Ithaca, N.Y. Dept. of Environmental Engineering.
J. J. Bisogni, Jr., and A. W. Lawrence.
Environmental Science and Technology, Vol 8, No 9, p 850-852, September 1974. 4 tab, 8 ref.

Descriptors: *Mercury, *Analytical techniques, *Absorption, *Water analysis, Chromatography, Aqueous solutions, Public health, Toxicity, Water pollution, Water chemistry, Chemical analysis, Solubility, Sorption, *Pollutant identification, Chemistry, Analysis.
Identifiers: Monomethyl mercury, *Methyl mercury, Flameless atomic absorption, Benzene extraction, Organomercurials, Atomic absorption, Thin-layer chromatography.

A method of measuring submicrogram quantities of monomethyl mercury was described. The procedure combines aspects of several published methods of mercury analysis. Methyl mercury is separated from inorganic mercury by benzene extraction. The extracted methyl mercury is then analyzed by a flameless atomic absorption procedure. Thin-layer chromatography is employed as a verification step. The procedure is applicable to a wide variety of aquatic samples containing monomethyl mercury. Interfering agents include elevated concentrations of chlorides, organic solvents, inorganic mercury, dimethyl mercury, and other forms of organic mercury. Methods to attenuate these interferences were discussed. Mean recovery efficiencies of greater than 90% were obtained with coefficients of variation less than 4.1% for monomethyl mercury spiked into microbial biomass. The appropriate analytical apparatus can be set up at a relatively low cost. (Henley-ISWS)
W75-00329

METABOLITES OF AN ACTINOMYCES BIWAKI-B STRAIN, ISOLATED FROM SEDIMENT IN LAKE BIWA: IDENTIFICATION OF THE ODOROUS COMPOUNDS, GEOSMIN AND 2-METHYLISOPORNEOL, AND ANALYSIS OF FATTY ACIDS, (IN JAPANESE),
Kyoto Univ. (Japan). Faculty of Pharmaceutical Sciences.
T. Kikuchi, T. Mimura, Y. Moriwaki, K. Negoro, and S. Nakazawa.
Yakugaku Zasshi. Vol 93, No 5, p 658-663. 1973. Illus. (English summary).

Descriptors: *Actinomyces, Sediments, *Metabolites, Odors, Organoleptic properties, *Fatty acids, Pollutant identification.
Identifiers: Geosmin, Methylisoporneol, *Japan(Lake Biwa).

An earthy smelling Actinomyces, Biwako-B strain, was isolated from the sediment in Lake Biwa, the source of water supplies of kyoto City (Japan). The odorous metabolites produced by this Actinomyces were geosmin and 2-methylisoborneol, proved by means of GC (gas chromatography) and GC-MS (mass spectrometry). Fatty acids obtained from Biwako-B strain were also examined.--Copyright 1974, Biological Abstracts, Inc.
W75-00349

ACCUMULATION AND MOVEMENT OF MIREX IN SELECTED ESTUARIES OF SOUTH CAROLINA, 1969-71,
Environmental Protection Agency, Gulf Breeze, Fla. Gulf Breeze Environmental Research Lab.
For primary bibliographic entry see Field 5B.
W75-00360

GAS-LIQUID CHROMATOGRAPHY-MASS SPECTROMETRY OF ORGANOMERCURY COMPOUNDS,
National Environmental Research Center, Athens, Ga. Southeast Environmental Research Lab.
G. L. Bauchman, M. H. Carter, and N. L. Wolf.
J Chromatogr. Vol 76, No 2, p 471-476. 1973, Illus.

Descriptors: *Gas chromatography, Analytical lectuniques, Mercury, Spectrometers, *Mass spectrometry, Heavy metals, Bromides, Chlorides, Iodides, Pesticides, Chromatography.
Identifiers: Acetates, *Methyl mercury, *Phenyl mercury.

Results suggest that ionic methylmercury compounds undergo decomposition during gas-liquid chromatography (GLC). The decomposing proportion appears to increase as the sample size decreases. With larger samples (10-5g), the methylmercury salts (CH3HgX; X=C1, Br, I) elute with characteristic retention times. When sample sizes are smaller (10 to the minus 8th power g) single elution peaks having the same retention time are obtained regardless of X. The more ionic methylmercury compounds (MMH(methylmercuric hydride) and MMA(methylmercuric acetate)) are not eluted even at higher concentrations although decomposition products emerge. The phenylmercury salts, even at large sample sizes, decompose to give DPM(diphenylmercury) as the major product. The relatively nonionic organomercurials DMM and DPM are eluted with no indication of decomposition. The pathways for the decomposition probably involve free radical or symmmetrization reactions in which the Hg-X bond is cleaved. The product ratios are not reproducible and depend on the impurities in the injection port or on the column. Reliable analyses for methylmercury salts may be achieved using GC but only if specially treated columns are employed to make the decomposition reactions reproducible. Valid data can be obtained by treating the column with halide salts. The results emphasize the need for this column treatment. As phenylmercury salts decompose extensively, GLC is not a good method for their analysis.--Copyright 1973, Biological Abstracts, Inc.
W75-00364

LACUSTRINE ZOOPLANKTON CATCHING EFFICIENCY OF TWO NETS WITH DIFFERENT MOUTH DIAMETERS, (IN ITALIAN),
Parma Univ. (Italy). Istituto di Zoologia e Anatomia Comparata.
For primary bibliographic entry see Field 7B.
W75-00368

AUTOMATIC DETERMINATION OF AMMONIA AND AMINO-ACID NITROGEN IN MARINE AND BRACKISH WATERS, (IN ITALIAN),
Istituto di Biologia del Mare, Venice (Italy).
For primary bibliographic entry see Field 2K.
W75-00387

EVALUATION OF WATER QUALITY BY MEANS OF ENZYMES AND OF 'THRUFLO' ANALYZERS,
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
G. Gorin.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 799 $3.25 in paper copy, $2.25 in microfiche. Oklahoma Water Resources Institute, Stillwater, Completion Report, (1974). 8 p, 5 ref. A-041-OKLA(1), 14-31-0001-4036.

Descriptors: *Chemical oxygen demand, *Information retrieval, *Water analysis, Dissolved oxygen, *Enzymes, *Pollutant identification, Data collections.

Improved procedures have been developed for the determination of chemical oxygen demand. They include: modification of the procedure to analyze small samples in ordinary test tubes with no condenser; construction of a special heating block to accommodate several samples; and determination of the dichromate consumed by spectrophotometry. Methods for the determination of pesticides of pesticides, based on their inhibitory effect on acetylcholinesterase, have been surveyed and evaluated. Many procedures have been described, but there appears to be scope for further improvement. Other applications of enzymes are more promising, however. In general, enzymes should serve best in the determination of specific substances in complex mixtures. The possibility of using enzymes to replace the COD and BOD tests has been considered, but no suitable enzymes have been found. A system has been developed for information storage and retrieval, which is very simple yet efficient and versatile. A classification scheme is developed as the collection grows, which is hierarchic and decimal -- i.e. the collection is subdivided into nine taxa, each of these into nine subtaxa, tertiary taxa, etc. The scheme can be expanded and easily modified as the collection grows. IBM cards are used to index the collection; an author and a classified subject index are readily produced by machine.
W75-00427

ZOOPLANKTON SPECIES AS INDICATORS OF ENVIRONMENT,
Jyvaskyla Univ. (Finland). Dept. of Biology.
For primary bibliographic entry see Field 5C.
W75-00437

MACROINVERTEBRATE COMMUNITY STRUCTURE AS AN INDICATOR OF ACID MINE POLLUTION,
Haywood Technical Inst., Clyde, N. C. Dept. of Biological Sciences.
For primary bibliographic entry see Field 5C.
W75-00438

THE DIATOM SUCCESSIONS IN THE RECENT SEDIMENTS AND THE EUTROPHICATION OF RISTISELKA, LAKE PAIJANNE, CENTRAL FINLAND,
Hydrobiological Research Inst., Jyvaskyla (Finland).
For primary bibliographic entry see Field 5C.
W75-00439

EVALUATION OF PHILODINA ACUTICORNIS (ROTIFERA) AS A BIOASSAY ORGANISM FOR HEAVY METALS,
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Biology; and Virginia Polytechnic Inst. and State Univ., Blacksburg. Center for Environmental Studies.
For primary bibliographic entry see Field 5C.
W75-00455

5B. Sources Of Pollution

RESERVOIR SEDIMENTATION: A COMPUTER SIMULATION,
Kansas Water Resources Research Inst., Manhattan.
For primary bibliographic entry see Field 2J.
W75-00004

A THERMAL WAVE FLOWMETER FOR MEASURING COMBINED SEWER FLOWS,
Hydrospace-Challenger, Inc., Rockville, Md.
R. A. Blase, and P. W. Eshleman.
Copy available from GPO Sup Doc as EP1.23/2:73-145, $1.25; microfiche from NTIS, Springfield, Va. 22161 as PB-227 370, $2.25. Environmental Protection Agency, Technology Series Report EPA-R2-73-145, March 1973. 100 p, 21 fig, 2 tab, 66 ref, 4 append. Project EPA 11020 EYD 14-12-911.

Descriptors: *Flow measurement, *Combined sewers, *Anemometers, *Flowmeters, Discharge measurement, Storm drains, Hydraulics, Pipes, Water pollution sources.
Identifiers: Time-of-flight, Correlators, Integrated circuits, *Thermal techniques.

A study of the application of thermal techniques to the measurement of flow rates in combined sewers has been conducted. The utilization of flush-mounted hot wire or hot film anemometers in a direct reading mode was extensively investigated. It was concluded that such a direct reading application was not feasible due to shifts in calibration caused by the build-up of contamination and the lack of commercially available units with sufficient ruggedness and reliability for application in a combined sewer pipe. A particular technique, which is based upon measuring the time-of-flight of thermal pulses generated at various positions around the perinphery of the pipe, was investigated in depth. A full scale prototype unit was fabricated and tested. These tests indicated that the configuration does not provide signals which have precision to enable the measure of fluid flow with the desired accuracy. (EPA)
W75-00006

POLLUTIONAL PROBLEMS AND RESEARCH NEEDS FOR AN OIL SHALE INDUSTRY,
Robert S. Kerr Environmental Research Lab., Ada, Okla.
F. M. Pfeffer.
Copy available from GOP Sup Doc as EP1.23:660/2-74-067, microfiche from NTIS, Springfield, Va. 22161 as PB-236 608 $2.25. Environmental Protection Agency, Technology Series Report EPA-660/2-74-067, June 1974. 36 p, 5 fig, 3 tab, 27 ref, 4 append. EPA Project 14030. ETY Program Element 1BB040.

Descriptors: *Oil shales, *Waste dumps, *Slope stabilization, *Rainfall-runoff relationships, Erosion control, Percolating water, Leaching, Vegetation establishment, Dewatering, Radioactive wastes, Waste water(Pollution), Waste water disposal, Waste water treatment, Utah, Colorado, Wyoming.
Identifiers: *Research needs, Shale ash disposal, Green River formation.

The oil shale resources and surface stream drainage within the Green River Formation of

Colorado, Utah, and Wyoming are presented briefly. The aboveground retorting processes of the Bureau of Mines, Union Oil Company, and The Oil Shale Corporation are described, as are the physical and leaching characteristics of spent shale resudues derived from each process. Oil shale retorting in place (in situ) is summarized. The area of major concern, stabilization of spent shale residues, is covered in detail. Other areas of environmental concern are discussed: retort waste water, process water from shale-oil upgrading, dewatering operations, mineral recovery, and contamination of groundwater by radioactivity. Research needs are presented: a tri-state groundwater report; environmental base line data; an assessment of total environmental impact; pollution control guidelines; effluent limitations; and continuous EPA monitoring. (EPA)
W75-00012

DEVELOPMENT OF ON-SHORE TREATMENT SYSTEM FOR SEWAGE FROM WATERCRAFT RETENTION SYSTEM,
FMC Corp., San Jose, Calif. Advanced Products Div.
For primary bibliographic entry see Field 5D.
W75-00014

EXPERIENCES OF LAKE CURRENT MEASUREMENTS OBTAINED IN CONNECTION WITH WASTE WATER FLOW STUDIES,
State Inst. for Technical Research, Otaniemi (Finland). Reactor Lab.
R. Kuoppamaki, and J. Kuusi.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 3-7, 1973. 3 fig, 4 ref.

Descriptors: *Water balance, Hydraulics, *Instrumentation, *Tracers, Radioisotopes, Analytical techniques, Hydrology, Lakes, Currents(Water), Velocity, Current meters, Winds, Flowmeters, Waste water(Pollution), Flow measurement, *Path of pollutants.
Identifiers: *Physico-geography.

Radioisotope tracer techniques have been successfully used for waste water flow pattern determinations in watercourses. Described were the methods and instruments used and the experiences obtained with lake current measurements. Studies carried out during the ice-free period repeatedly provided examples of the dominant effect of winds on the surface streams in lakes, while studies made during the ice cover period gave examples of the presence of stratified currents. Operating principles and the prototype version of an instrument to measure velocities in the range of 0 to 2 cm/s were described. (See also W75-00029) (Humphreys-ISWS)
W75-00030

THE CONSTRUCTION AND MANAGEMENT OF SANDPIT LAKES IN THE WESTERN AREA OF THE NETHERLANDS,
South Holland Provincial Waterboard, The Hague (Netherlands).
J. W. Stellingwerff.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 462-474, 1973. 7 fig, 2 tab, 8 ref.

Descriptors: *Water management(Applied), *Lakes, *Thermocline, *Eutrophication, *Chemical properties, *Sand pits, Limnology, Surface drainage, Groundwater movement, Chlorides, Phosphates, Dredging, Water levels, Water quality, Thermal stratification.
Identifiers: *Netherlands, *Deoxygenation.

There is a large demand for sand in the densely populated, low lying western part of the Netherlands. Much of this sand is obtained by dredging from sandpit lakes. The water level and water quality in these lakes relate to surface drainage water and groundwater. The problem of thermal stratification was examined. The chemical properties depend on connection with other surface waters, and are influenced by the thermocline. Eutrophication is taking place and deoxygenation to critical oxygen levels occurs in some of the lakes. (See also W75-00029) (Adams-ISWS)
W75-00093

DDT RESIDUES IN SOIL, WATER, AND FAUNA FROM NEW YORK APPLE ORCHARDS,
New York State Agricultural Experiment Station, Geneva. Dept. of Entmology.
R. J. Kuhr, A. C. Davis, and J. B. Bourke.
Pesticides Monitoring Journal, Vol 7, No 3/4, p 200-204, March, 1974. 2 tab, 15 ref.

Descriptors: Pesticides, *Soils, Streams, *DDD, *DDE, *DDT, *Pesticide residues, Aquatic life, Pollutants, Animals, Sampling, *New York, Orchards, *Apples.

Five commercial apple orchards which had not been sprayed extensively with DDT for twelve years were surveyed in 1972 for residues of DDT and its metabolities. In addition to the present compound, DDE and DDD were almost recovered, but no dicofol was detected in any soil sample. Total residues in the top 6-inch soil layer underneath the trees ranged from 21.8 to 259 lb/acre. Between the rows of trees the levels were considerably lower; they ranged from 7.3 to 78.5 lb/6-inch acre. In one heavily contaminated orchard, researchers also analyzed stream water, stream-bottom mud, and animals. Very low amounts of DDT (0.32 ppb) and DDD (0.042 ppb) were found in the water. Residues in stream-bottom mud totaled less than 1 ppm. Worms, slugs, snails, tadpoles, fingerling fish, and frogs all contained DDD, DDE, and DDT. (Prague-FIRL)
W75-00109

WHY IT MAY COST 100 MILLION (POUNDS) TO CLEAN UP MERSEY SHORES,
For primary bibliographic entry see Field 5G.
W75-00110

THE FATE OF PHENOLICS IN WASTEWATER - DETERMINATION BY DIRECT-INJECTION GLC AND WARBURG RESPIROMETRY,
Los Angeles County Sanitation District, Whittier, Calif. San Jose Creek Water Quality Lab.
R. B. Baird, C. L. Kuo, J. S. Shapiro, and W. A. Yanko.
Archives of Environmental Contamination and Toxicology, Vol 2, No 2, p 165-178, May, 1974. 6 fig, 4 tab, 13 ref.

Descriptors: *Activated sludge, *Biodegradation, *Respiration, Simulation analysis, *Phenols, Toxicity, Analytical techniques, *Chromatography, Effluents, Industrial wastes, Pollutant identification.
Identifiers: Cresol isomers, Chlorophenols, Warburg technique.

The effects of phenol, cresol isomers, and chlorinated phenols on the respiration of activated sludges have been studied using Warburg techniques. The biodegradability of these materials under simulated treatment conditions in activated sludge also was determined. Results show that less than 10 mg/liter concentrations of phenol and chlorophenols, while being biodegraded, proved toxic to sludges unacclimated to phenolics. The toxic effects of the cresols were not so severe for the sludges tested. Phenolic analysis in these studies was accomplished employing GLC techniques with a new column packing, dinonylphthalate on Chromosorb G. This chromatographic technique was effective in rapidly identifying phenolic materials in activated sludge, treatment plant effluents, and industrial discharges. Separation of all isomers tested, except m- and p-chlorophenol, was possible using this technique. (Sandoski-FIRL)
W75-00130

PERCOLATION TESTS IN STRATIFIED SOIL,
A. Manke.
Water and Sewage Works, p 42, 44, 46, April 30, 1974. 2 fig.

Descriptors: *Percolation, Percolating water, Testing, Data collections, *Soil types, Saturation, Silts, *Water reuse, *Path of pollutants.
Identifiers: *Stratified soils.

Percolation tests can easily produce varying results when the hole is filled with water and allowed to soak in order to saturate the soil before determining the final percolation data. Where the soil is of the same consistency or homogeneous for the entire depth of the 30-inch hole, this method of saturating the soil does not encounter the difficulties which are inherent where two or more definite layers of widely differing soil are present. Results obtained when three definite layers of soil were encountered in digging a hole to a depth of 30 inches to perform a percolation test are presented. Another test was undertaken to determine if the percolation rate of 116 minutes was due to saturation or to silt from the top layer getting into the pores of the lower soil layer. Results indicate that a different approach should be used to obtain a percolation test in a reasonably well-saturated area where the soil for the 30-inch hole has layers which are of an entirely different nature. These tests also show the importance of avoiding silting action in the drainage trench, particularly when the trench is located in a stratified soil of this type. (Sandoski-FIRL)
W75-00132

CRITICAL OXYGEN DEFICIT FOR BANK OUTFALL,
Illinois Univ., Urbana. Dept. of Civil Engineering.
O. E. Rood, Jr., and E. R. Holley.
Journal of the Environmental Engineering Division, American Society of Civil Engineers, Vol 100, No EE 3, p 661-678, June, 1974. 6 fig, 1 tab, 12 ref.

Descriptors: *Biochemical oxygen demand, *Numerical analysis, *Dissolved oxygen, Equations, Mathematical studies, Channels, *Path of pollutants, Oxygen requirements.
Identifiers: *Mass balance, Transverse mixing, Bank outfall.

The two-dimensional mass balance equation has been solved numerically to investigate the effects of transverse mixing on the DO downstream of a bank outfall of BOD in a rectangular channel with no upstream BOD or deficit. From the numerical results, the magnitude and location of the critical deficit have been obtained. Dimensional analysis has been used to generalize the presentation of the results. Results are presented in graphical form and a method is given for predicting the critical deficit for various situations. For some situations the solution to the two-dimensional equation indicates that the magnitude of the critical deficit may be significantly larger than that predicted by the traditional one-dimensional equations and that the longitudinal distance between the outfall and the location of the critical deficit may be only 40-50 percent of that predicted by the one-dimensional representation. (Sandoski-FIRL)
W75-00134

AERIAL INFRARED THERMOGRAPHY IN THE SERVICE OF WATER PROTECTION: AN EXAMPLE: THE CASE OF CHARENTE (LA

THERMOGRAPHIE INFRAROUGE AEROPORTEE AU SERVICE DE LA PROTECTION DES EAUX: UN EXEMPLE: LE CAS DE LA CHARENTE),
For primary bibliographic entry see Field 5A.
W75-00157

THE GEOPHYSICAL BEHAVIOR OF THE ENVIRONMENTAL ISOTOPES AS A BASIS FOR MODEL CALCULATIONS IN ISOTOPIC HYDROLOGY (DAS GEOPHYSIKALISCHE VERHALTEN DER UMWELTISOTOPE ALS BASIS FUER MODELLRECHNUNGEN IN DER ISOTOPENHYDROLOGIE),
H. Oeschger, and A. Gugelmann.
Oesterreichische Wasserwirtschaft, Vol 26, No 3/4, p 43-49, April, 1973. 11 fig, 6 ref.

Descriptors: *Isotopes(Radioactive), *Environmental effects, *Radioactive dating, Hydrology, *Model studies, Hydrologic models, Flow models, Analytical techniques, *Pollutant identification, *Path of pollutants.
Identifiers: Piston-flow models, Water dating(Isotopic).

The geophysical behavior of natural and anthropogenic radioactive isotopes in the evnironment is discussed with respect to their use for hydrological studies, especially for the dating of waters. For practical purposes, input concentrations of natural isotopes such as tritium, 14C, 32Si, 39Ar, 81Kr, and 36Cl may be regarded as constant for the time before 1954, the year of the first A-bomb test. The isotope ratios 180/160, deuterium/H, and tritium/H were found to exhibit seasonal variation which is to be considered in isotope dating. The 85Kr concentration in air and water has been linearly increasing for the last two decades. The A-bomb and H-bomb tests have resulted in tritium and 14C concentrations now exceeding the natural levels measured before the tests. Natural radioactive isotopes are suited to the determination of the age distribution of water in hydrological systems either by the piston-flow model, excluding the mixing of waters of different ages, or by the exponential model allowing for mixing of different water bodies. (Takacs-FIRL)
W75-00158

THE USE OF ARTIFICIAL RADIOACTIVE TRACERS FOR THE SOLUTION OF HYDROLOGICAL PROBLEMS (DIE VERWENDUNG KUENSTLICHER RADIOAKTIVER MARKIERUNGEN ZUR LOESUNG HYDROLOGISCHER PROBLEME),
For primary bibliographic entry see Field 2F.
W75-00163

THE SIGNIFICANCE OF ISOTOPIC MEASUREMENTS FOR COMBINED KARST WATER STUDIES (DIE BEDEUTUNG VON ISOTOPENMESSUNGEN IM RAHMEN KOMBINIERTER KARSTWASSERUNTERSUCHUNGEN),
For primary bibliographic entry see Field 2F.
W75-00164

THE USE OF ARTIFICIAL RADIOACTIVE TRACERS FOR THE SOLUTION OF HYDROLOGICAL PROBLEMS. PART I: METHODS (DIE VERWENDUNG KUENSTLICHER RADIOAKTIVER MARKIERUNGEN ZUR LOESUNG HYDROLOGISCHER PROBLEME. TEIL I: METHODIK),
For primary bibliographic entry see Field 2F.
W75-00165

WATER ANALYSIS IN THE KELETI CANAL (VIZVIZSGALATOK A KELETI FOCSATORNAN),
T. K. Keve, C. Pinter, and T. Munkacsy.
Hidrologiai Kozlony, Vol 54, No 1, p 32-40, January, 1974. 5 fig, 2 tab, 14 ref.

Descriptors: *Water quality control, *Monitoring, *Irrigation canals, Canals, *Potable water, Flow velocity, Biochemical oxygen demand, Algae, Nitrogen, Phosphorus, Hydrological aspects, *Percolation, Water analysis, Water supply.
Identifiers: *Hungary(Keleti canal).

Results of the systematic water quality monitoring performed in the Keleti Focsatorna, a 100 km long drain and irrigation canal connected with the Tisza river in Eastern Hungary are presented. The water yield of the canal amounts to 10-40 cu m/sec. The monitoring was conducted with respect to the future use of the canal water for drinking water prepared by the percolation method. The water quality was found to be determined by that of the Tisza river on one hand, and by the momentary mode of use of the canal on the other hand. With the flow velocity in the river exceeding that in the canal, reduction of the suspended matter content and of the BOD level and an increase of the clearness of the canal water was observed. During high-water periods in the river, seston contents of several hundred mg/liter, and BOD levels of 10-15 mg/liter were measured in the canal water. Cleaning of the water and algal proliferation after such high-water periods were observed. During periods of high stagnant water yield, increased nitrogen and phosphorus levels, and change from calcium hydrocarbonate to sodium hydrocarbonate in the canal water were determined. (Takacs-FIRL)
W75-00167

BIOLOGICAL AND BACTERIOLOGICAL INVESTIGATIONS OF A SLIGHTLY POLLUTED SURFACE WATER (DANUBE) AND OF A HIGHLY POLLUTED SURFACE WATER (SZILAS CREEK) (BIOLOGIAI ES BAKTERIOLOGIAI VIZSGALATOK EGY KISSE SZENNYEZETT (DUNA) ES EGY EROSEN SZENNYEZETT (SZILAS-PATAK) FELSZINI VIZFOLYASBAN),
J. Hegedus, L. Nemedi, and J. Hegedus.
Hidrologiai Kozlony, Vol 54, No 1, p 26-31, January, 1974. 5 fig, 11 ref.

Descriptors: Surface waters, Investigations, Streams, *Bacteria, Phytoplankton, Water quality, Seasonal, Salmonella, Water pollution sources, Biology, Water pollution effects.
Identifiers: *Bacteriological investigations, *Hungary(Danube River), *Hungary(Szilas Creek).

Year-round comparative biological and bacteriological investigations of the water quality in a lightly polluted stream (Danube) and in a highly polluted creek (Szilas-patak) in Hungary are presented. The bacteriological investigations were concerned with the total bacteria count between 20 and 37 C, and the Streptococcus feecalis, Clostridium, Salmonella, and Shigella counts. The biological investigations covered the study of the qualitative relations of phytoplankton, and bacteria and fungi that can be determined by microscopic and saprobiological methods. The water quality of the Danube was determined to vary between B-mesosaprobic and a-mesosaprobic with temporary pa-mesosaprobic periods. Unlike Szilas creek, the Danube exhibited pronounced seasonal changes in water quality. Strong parallelism between the water qualities as determined by the biological and the bacteriological method was established. However, the biological quality was better in summer, and the bacteriological quality was better in winter in the Danube. Pathogenic bacteria, such as Salmonella, were present in Szilas creek almost all the time. (Takacs-FIRL)
W75-00168

ORGANICS,
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
R. A. Mineat, and P. S. Pagoria.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1058-1100, June, 1974. 2 tab, 434 ref.

Descriptors: *Reviews, *Organic matter, Detergents, Surfactants, Oil, Pesticides.
Identifiers: Oxygen demand, Organic carbon, Grease.

A review of the 1973 literature concerning various organic material is grouped into several categories. These include oxygen demand and organic carbon, detergents and surfactants, oils and greases, pesticides, and other organic species. (Sandoski-FIRL)
W75-00194

DETERGENTS,
MCA Engineering Corp., Baltimore, Md.
S. K. Banerji.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1140-1145, June, 1974. 26 ref.

Descriptors: *Reviews, *Detergents, Phosphorus, Environmental effects, Nitrilotriacetic acid, Aquatic environment, Toxicity, Surfactants, Biodegradation, Pilot plants.
Identifiers: EDTA, ABS, STPP, Cation mobilization, NTA.

A review of the literature reported in 1973 indicates a continued interest in detergent builder compounds. Major topics include the control of phosphorus, environmental effects from the use of nitrilotriacetic acid (NTA); the influence on the major cation mobilization by STPP, NTA, or ethylenediaminetetraacetic acid (EDTA); aquatic effects such as fertility and toxicity from exposure to surfactants; microbial metabolism of alkylbenzene sulfonate (ABS); biodegradation and recovery of nonionic surfactants; and, the biodegradation of cationic surfactants in activated sludge pilot plants. (Sandoski-FIRL)
W75-00196

HEAVY METALS AND OTHER TRACE ELEMENTS,
Illinois Univ., Urbana.
For primary bibliographic entry see Field 4C.
W75-00198

MARINE AND ESTUARINE POLLUTION,
California State Univ., Long Beach. Dept. of Biology.
D. J. Reish, and T. J. Kauwling.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1437-1451, June, 1974. 151 ref.

Descriptors: *Water pollution, *Estuaries, *Aquatic environments, Waste disposal, Oil spills, Radioactivity, Pesticides, Plankton, Benthos, Oceans.
Identifiers: *Marine organisms.

A study of marine pollution was made by Aubert and Aubert (Rev. Itern dOceanographic Medical Supplement, 1973) emphasizing the sources of contamination, the techniques for measuring the extent of pollution, and its prevention. Waste disposal, oil spills, radioactivity, heat and pesticides were considered in terms of their effect on marine organisms. Possible solutions to these problems were presented, being summaries of previous experiments dealing with the Columbia River Estuary, Southern California Bight, Chesapeake Bay, and Port Philip Bay, Australia. Chemical and physical characteristics of water and sediment and the planktonic and benthic biota are included. (Leibowitz-FIRL)
W75-00200

AQUATIC SEDIMENTS,
Massachusetts Univ., Amherst.
W. C. Ku, and G. W. Foess.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1420-1437, June, 1974. 66 ref.

Descriptors: *Sediments, *Water quality, *Water pollution, Fish, Wildlife, Water supply, Agricul-

ture, Industry, Waste water disposal, Copper, Heavy metals.
Identifiers: NTA.

Various chemical transformations occurring in sediments, and their effects on the quality of overlying water was the basis of most of the literature of 1973. Examples from the United States were studied to determine the effect of sediment on water quality. Also discussed were sediment-water relationships and their influence of water usage, fish and wildlife habitat, public water supply, agricultural and industrial use and the disposal of waste water. Other investigators examined the release of heavy metals and inorganic constituents from sediments. It was determined that nitriloriacetic acids could release heavy mental ions from their complexes with humic compounds in sediments. Further data obtained that the amount of copper released from sediments decreased with the increase of the NTA. Further studies on the interaction of sediment and water are mentioned. (Leibowitz-FIRL)
W75-00201

RADIOACTIVE WASTES,
Minnesota Univ., Minneapolis.
C. P. Straub.
Journal of the Water Pollution Control Federation, Vol 46, No 6, p 1317-1335, June, 1974. 123 ref.

Descriptors: *Reviews, *Radioactive wastes, Precipitation, Solvent extraction, Adsorption, Ion exchange, Flotation, Evaporation, Environmental effects, Aquatic environment, Costs, Underground storage.
Identifiers: Ore processing, Fixation, Transmutation, Organism uptake, Radiological protection.

A review of the literature on the topic of radioactive wastes is outlined to include the following aspects: ore processing, precipation, solvent extraction, adsorption and ion exchange, fixation, ground disposal, flotation, evaporation, transmutation, water environments, uptake by organisms, costs, and radiological protection. (Sandoski-FIRL)
W75-00202

DECONTAMINATE WATER BEFORE IT GETS INTO THE GROUND,
Geraghty and Miller, Port Washington, N.Y.
D. W. Miller.
Water and Sewage Works, Vol 121, No 6, p 51-53, June, 1974.

Descriptors: *Groundwater, *Groundwater movement, Water pollution sources, Water pollution effects, Monitoring, Research and development, Aquifers, Water quality control, Water pollution control.

Some of the principles governing movement of a water body containing pollutants within the groundwater system are reviewed. The principal factors involved in the difficulty of monitoring the safety of groundwater resources in any particular region and of providing a means for adequate warning against use of waters that may be harmful are presented. The author advocates increased research directed toward developing new methods for the correction of groundwater contamination problems; the development of new strategies directed toward the control of potential future problems; and a greater appreciation of the importance of protecting this resource from water quality degradation. (Sandoski-FIRL)
W75-00208

GREAT LAKES RESEARCH ADVISORY BOARD THIRD SEMI-ANNUAL REPORT, APRIL 1974.
For primary bibliographic entry see Field 2H.
W75-00229

QUANTITY AND CHEMICAL QUALITY OF LOW FLOW IN THE FRIO RIVER, TEXAS, DECEMBER 18-21, 1967,
Geological Survey, Austin, Tex.
For primary bibliographic entry see Field 2K.
W75-00237

DISCUSSION OF REGULATORY CRITERIA FOR OCEAN DISPOSAL OF DREDGED MATERIALS: ELUTRIATE TEST RATIONALE AND IMPLEMENTATION GUIDELINES,
Army Engineer Waterways Experiment Station, Vicksburg, Miss. Office of Dredged Material Research.
For primary bibliographic entry see Field 5G.
W75-00242

NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY,
Environmental Protection Agency, Annapolis, Md. Annapolis Field Office.
L. J. Clark, and N. A. Jaworski.
Available from NTIS, Springfield, Va. 22161 as PB-229 815 Price $5.75 printed copy; $2.25 microfiche. Technical Report 37, October 1972. 132 p, 79 fig, 4 tab, 13 ref.

Descriptors: *Estuaries, *Potomac River, *Water pollution effects, *Mathematical models, Simulation analysis, Nitrates, Phosphates, *Dissolved oxygen, Biochemical oxygen demand, Streamflow, *Nutrients.
Identifiers: *Potomac Estuary.

A mathematical modeling study of water quality in the Potomac Estuary was made to (1) predict nitrogen and phosphorus distributions during both a relatively short time period and over an annual cycle, (2) define the various reaction rates, including temperature effects, directly influencing nutrient transport, (3) evaluate the role of both nitrogen and phosphorus in the existing eutrophication problem and develop predictive capabilities for algal standing crop, (4) formulate a DO budget model incorporating algal effects in addition to biological oxidation and reaeration, and (5) determine the maximum allowable loadings of nitrogen, phosphorus and carbon (BOD) that will maintain water quality commensurate with existing standards. There are currently 18 wastewater treatment facilities in the Washington metropolitan area. During the period February 1969 to February 1970 the average nutrient contributions from the upper Potomac River basin were phosphorus (as P), 4, 580 lbs/day, and nitrogen (as N), 59,000 lbs/day. These loadings correspond to an average freshwater flow of 6,900 cfs. (Knapp-USGS)
W75-00243

RADIOACTIVE WASTE STORAGE IN THE ARID ZONE,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 5E.
W75-00247

KAOLINITE SYNTHESIS AT 25 DEG C,
Geological Survey, Menlo Park, Calif.
For primary bibliographic entry see Field 2K.
W75-00248

POLLUTION CONTROL FROM EXPLOSIVE PRODUCTION WASTE STREAMS,
Picatinny Arsenal, Dover, N.J.
For primary bibliographic entry see Field 5D.
W75-00253

LEACHING OF PICLORAM AND NITRATE IN TWO ALABAMA SOILS,
Auburn Univ., Agricultural Experiment Station.
A. E. Hiltbold, B. F. Hajek, G. A. Buchanan, and C. E. Scarsbrook.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 856, $3.25 in paper copy, $2.25 in microfiche. Department of Agronomy and Soils, Departmental Series No 18, July 1974. 19 p, 10 fig, 4 ref. OWRT A-027-ALA(2).

Descriptors: Pesticides, *Herbicides, Pollution, Soils, Classification, *Leaching, *Alabama, *Nitrates, *Path of pollutants, Phytotoxicity, Mathematical models, Loam, Sands.
Identifiers: *Picloram.

Picloram is an extremely potent herbicide used for control of perennial broad-leaved plants in noncropland areas. The persistence of picloram, its mobility in surface and percolating water, and its phytotoxicity at extremely low rates present an unusual situation as to potential environmental impact of a herbicide. Conclusions are presented regarding movement of nitrate and picloram downward in Dothan loamy sand and in Hartsells fine sandy loam. A mathematical model of nitrate leaching was developed that fit the observed leaching in these soils within the range of field sampling procedure.
W75-00263

COMBINED BUOYANCY AND BOUNDARY EFFECTS AND AERATION EFFECTS ON JET SPREADING,
Connecticut Univ., Storrs. Inst. of Water Resources.
For primary bibliographic entry see Field 5G.
W75-00265

METABOLIC CAPABILITIES OF SULFUR OXIDIZING BACTERIA AND THEIR ROLE IN WATER POLLUTION,
Kentucky Univ., Lexington. Water Resources Research Inst.
M. I. H. Aleem.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 813, $5.75 in paper copy, $2.25 in microfiche. Research Report No 77, September 1974. 123 p, 43 fig, 19 tab, 129 ref. OWRT A-027-KY(1). 14-31-0001-3517. 14-31-0001-1636.

Descriptors: Sulfides, Sulfates, *Sulfur bacteria, *Microorganisms, Acid bacteria, *Sulfur compounds, *Metabolism, *Oxidation.
Identifiers: Sulfur oxidizing bacteria, Sulfites, Dissimilatory nitrate reduction, Chemosynthetic bacteria, Autotrophic energy metabolism, Purple sulfur bacteria.

Investigations are described into the physiology of microorganisms that are commonly involved in the oxidation of inorganic sulfur compounds. The metabolic activities of these bacteria play a potent role in several fields of economic importance such as strip mining operations, water pollution, corrosion, metallurgy, petroleum technology and soil fertility processes. The oxidation of inorganic sulfur compounds was studied in the chemolithotrophs Thiobacillus denitrificans, Thiobacillus A2, Thiobacillus neapolitanus, and a photolithotroph Rhodopseudomonas palustris. Cell suspensions from all of the thiobacilli catalyzed completely the oxidation of sulfide, thiosulfate, and sulfite to sulfate. The oxidation of thiosulfate in R. palustris was light-dependent and involved tetrathionate and trithionate as the major intermediates in the formation of sulfates. (Grieves-Kentucky)
W75-00270

A SURVEY OF ORGANIC CARBON CONSTITUENTS IN NATURAL FRESH WATERS,
Dept. of Civil and Mineral Engineering. Minnesota Univ., Minneapolis.
For primary bibliographic entry see Field 5A.
W75-00271

PREDICTING POLLUTION IN THE JAMES RIVER ESTUARY: A STOCHASTIC MODEL,
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Statistics.
H. Bard, and R. G. Krutchkoff.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 784, $5.75 in paper copy, $2.25 in microfiche. Virginia Water Resources Research Center, Blacksburg, Bulletin 70, (1974). 144 p, 48 tab, 17 ref. OWRT A-048-VA(2).

Descriptors: Nitrates, Nitrites, Bacteria, Water pollution effects, *Model studies, Water quality, *Estuaries, Computer models, *Mathematical models, *Virginia, *Path of pollutants, *Sewage, Water temperature, Carbon, Carbon dioxide, Phosphates, Nitrogen, Eutrophication.
Identifiers: *James River estuary(Va), Organic carbon, Orthophosphates.

Modeling the James River Estuary with the Schofield model was the major goal of the project. The model was set up for a 60 mile stretch of the estuary beginning at Richmond. Sensitivity studies involving rate constants, freshwater flow rate, sewage input, and water temperature were made and the results were analyzed. The average oxygen deficit concentration is insensitive to random water temperature, moderately sensitive to the sewage input rates investigated, and highly sensitive to changes in the organic carbon utilization rate constant. Organic carbon and carbon dioxide are insensitive to temperature and only moderately sensitive to change in the organic carbon rate constant. Ortho-phosphate concentration is insensitive to changes of the phosphate utilization rate constant and ortho-phosphate, organic carbon, and organic nitrogen are insensitive to a difference in the freshwater flow as great as 40 percent. Finally, nitrate + nitrite concentration, bacteria growth, and algal growth are insensitive to a reduction of the nitrogen waste from the point sources.
W75-00273

NORTH FORK ALLUVIAL DECONTAMINATION PROJECT, HUBBARD CREEK RESERVOIR WATERSHED,
West Central Texas Municipal Water District, Abilene.
For primary bibliographic entry see Field 5G.
W75-00275

TRITIUM HYDROLOGY STUDIES IN CALIFORNIA,
California Univ., Los Angeles. Dept. of Chemistry; and California Univ., Los Angeles. Inst. of Geophysics.
For primary bibliographic entry see Field 7B.
W75-00277

MONITORING TOXIC CHEMICAL POLLUTION FROM LAND DISPOSAL SITES IN HUMID REGIONS,
Illinois State Water Survey, Urbana.
W. H. Walker.
Ground Water, Vol 12, No 4, p 213-218, July-August 1974. 3 fig, 21 ref.

Descriptors: *Monitoring, Water pollution effects, *Soil contamination effects, *Vegetation effects, *Waste disposal, *Sampling, Humid areas, *Water pollution sources, Data collections, Evaluation, Public health, Ecosystems, Chemical analysis, Groundwater, Chemical wastes, Soil analysis.
Identifiers: Number and spacing of sampling stations, Sampling frequency.

Toxic chemical land disposal sites in humid regions may pollute contiguous air, soil, plant, and water ecosystems. Present monitoring of such sites generally includes only data collections of the ground and surface water facets. A monitoring system was presented which encompasses all pollution dissipation-retention regimes. Chemical analyses of plant, soil, and water samples collected from properly positioned sampling stations throughout affected areas were recommended. The number and spacing of sampling stations to use per unit area were presented in graphical form. A minimum of 9 and a maximum of 25 sampling stations were considered optimum for plant, soil, and groundwater monitoring purposes. The number of overland runoff sampling stations to employ was dictated by the topography of each site. (Walker-ISWS)
W75-00317

VARIATIONS IN THE NATURAL CHEMICAL CONCENTRATION OF RIVER WATER DURING FLOOD FLOWS, AND THE LAG EFFECT,
Newcastle-upon-Tyne Univ. (England). Dept. of Civil Engineering.
For primary bibliographic entry see Field 2E.
W75-00320

TOTAL DISSOLVED SOLIDS IN GROUND WATER OF THE WAINWRIGHT AREA, ALBERTA,
Research Council of Alberta, Edmonton.
D. A. Hackbarth.
Ground Water, Vol 12, No 4, p 206-212, July-August 1974. 6 fig, 1 tab, 9 ref.

Descriptors: *Chemical analysis, *Contours, *Dissolved solids, *Groundwater, *Canada, Glacial drift, Bedrock, Data processing, Quarternary period, Mathematical analysis, Geology, Hydrogeology, On-site investigations.
Identifiers: Alberta(Wainwright), Upper Cretaceous bedrock, Random data gridding.

Total dissolved solids in groundwater of the Wainwright area of Alberta, Canada, ranges from about 1000 to 2000 ppm in the primary glacial drift and bedrock aquifers. Variations are related to both the thickness and nature of the drift and underlying bedrock. Total dissolved solids in the groundwater in areas of thick and coarse-grained drift are lower than in areas of thin and fine-grained drift. The dissolved solids content of the bedrock is lower where the bedrock is of nonmarine origin and where the overlying drift is thick. The technique for gridding of random data developed by Newton (Jour. Int. Assoc, Math. Geol. Vol 5, No 2 1973) was one of the primary analysis procedures used in the study. (Walker-ISWS)
W75-00321

SITE EVALUATION AND DESIGN OF SEEPAGE FIELDS,
Connecticut Univ., Storrs. Dept. of Civil Engineering.
For primary bibliographic entry see Field 5D.
W75-00333

SEASONAL VARIATIONS AND DISTRIBUTION OF DISSOLVED IRON IN AN AQUIFER,
Geological Survey of Sweden, Stockholm.
J. Bergstrom.
Nordic Hydrology, Vol 5, No 1, p 1-31, 1974. 17 fig, 1 tab, 30 ref.

Descriptors: *Groundwater, *Water quality, *Chemical analysis, Iron, Water sampling, Manganese, Tritium, Percolation, Infiltration, Groundwater movement, Stratification, Glacial aquifers, Seasonal, Water supply, Autumn, Spring, Hydrogeology, Water table, Snow melt.
Identifiers: *Iron removal, *Sweden, Glaciofluvial deposit(Esker).

Treatment of groundwater for removal of iron is common in Sweden. To better understand the seasonal variation of iron and the contribution of iron from different groundwater layers the iron content of groundwater from a glaciofluvial deposit (esker) supplying a large community was studied. The iron content is lowest during the autumn rains and the spring snow melt. A general increase in the iron content occurs when the water table is lowered by increased water extraction. (Schicht-ISWS)
W75-00336

THE DISTRIBUTION AND NATURE OF AMINO ACIDS AND OTHER NITROGEN-CONTAINING COMPOUNDS IN LAKE ONTARIO SURFACE SEDIMENTS,
Canada Centre for Inland Water, Burlington (Ontario).
A. L. W. Kemp, and A. Mudrochova.
Geochim Cosmochim Acta. Vol 37, No 9, p 2191-2206. 1973. Illus.

Descriptors: *Amino acids, *Nitrogen compounds, *Lake Ontario, Sediments, Zooplankton, Urea, Chromatography, *Path of pollutants, Distribution.
Identifiers: Asparagine, Citrulline, Ethanolamine, Fulbic acid, Glutamine, Humic acid, Peptide, Pronase.

Five surface sediment samples (0-3 cm), 2 suspended sediment samples and a zooplankton sample from Lake Ontario (Canada, USA) were analyzed for N-containing compounds. Amino acids, amino sugars, ethanolamine and urea were separated and characterized by ion-exchange chromatography. Free amino acids and soluble combined amino acids and amino sugars accounted for less than 0.25% of the total N in the sediments. Insoluble combined amino acids and amino sugars were the most abundant N fraction in the sediments, making up from 49 - 55% of the total N. Evidence is presented that asparagine, glutamine and citrulline are presented in the interstitial waters and may make up part of the sediment organic N that was not characterized. The free amino acids released by the proteolytic enzyme, pronase, from the interstitial waters and sediment humic and fulbic acid extracts were determined. Pronase released 65% of the soluble combined amino acids and 34% of the fulbic acid amino acids as free amino acids. Enzyme activity was inhibited in the presence of the humic acid extract. The results indicate that the combined amino acids in the interstitial waters and fulvic acid extracts are intermediates between the primary aquatic detritus and the sediment humic acids. The enzume experiments and IR data indicate that part of the sediment amino acids are combined through peptide linkages.--Copyright 1974, Biological Abstracts, Inc.
W75-00343

WATER AND SALINE REGULATION IN LAKE CHAD, (IN FRENCH),
Office de la Recherche Scientifique et Technique Outre-Mer, Fort-Lamy (Chad).
For primary bibliographic entry see Field 2H.
W75-00346

THE NUMBER OF BACTERIA IN THE WATER OF KUIBYSHEV RESERVOIR AND ITS CORRELATION WITH THE AMOUNT OF ORGANO-MINERAL SUSPENSIONS, (IN RUSSIAN),
A. V. Ivatin.
Mikrobiologiya. Vol 42, No 3, p 525-529. 1973. (English summary).

Descriptors: *Bacteria, *Organic matter, Reservoirs, Water pollution sources.
Identifiers: *USSR(Kuibyshev reservoir).

The total number of bacteria in the water of the Kuibyshev reservoir (USSR) was determined by the direct counting on membrane filters; it varied within the range of 1.00-6.56 10 to the 6th power about 2.10 to the 6th power/ml of water. The number of total microflora directly correlated with the amount of organo-mineral particles suspended

in the water averaged 17.2 mg/l between May and Oct. During this time their amount varied within the range of 2.4-68.8 mg/l in the reservoir. The direct correlation between these indices is statistically reliable. The number of saprophyte bacteria growing on MPA (meat peptone agar) at room temperature was 30-3500 cells/ml. The maximum saprophyte bacteria, as well as the total bacterial number, was found during spring flood time. The ratio between the number of saprophyte bacteria and the total number of bacteria (in per cent) varied within the range of 0.007-0.045 in the course of navigation and was higher during the spring flood time (May).--Copyright 1974, Biological Abstracts, Inc.
W75-00355

ACCUMULATION AND MOVEMENT OF MIREX IN SELECTED ESTUARIES OF SOUTH CAROLINA, 1969-71,
Environmental Protection Agency, Gulf Breeze, Fla. Gulf Breeze Environmental Research Lab.
P. W. Borthwick, T. W. Duke, A. J. Wilson, Jr., J. I. Lowe, and J. M. Patrick, Jr.
Pestic Monit J. Vol 7, No 1, p 6-26. 1973. Illus.

Descriptors: *Estuaries, *Mirex, *Pesticide residues, Predators, Chromatography, Crabs, *South Carolina.
Identifiers: Ants, Shrimp, Birds, Fire, Mammals, *Mirex.

In conjunction with a fire ant eradication program during which mirex was aerially applied to coastal areas near Charleston, S.C., field studies were conducted to monitor the movement and accumulation of mirex in the extuarine system. Collections of background and periodic posttreatment samples of water, bottom sediments, shrimp, crabs, fish, and estuary-dependent birds and mammals were analyzed for mirex using electron-capture gas chromatography. The data revealed that mirex was translocated from treated lands and high marsh to estuarine biota-all animal classes sampled contained mirex; and biological concentration of mirex occurred-especially in predators such as racoons and birds. Mirex residue ranges for respective sample categories were: water (less than 10.01 ppb); sediment (0-0.07 ppm); crabs (0.0.60 ppm); fishes (0-0.82 ppm); shrimps (0-1.3 ppm); mammals (0-4.4 ppm); and birds (0-17.0 ppm). No mass mortalities were observed during the study.--Copyright 1974, Biological Abstracts, Inc.
W75-00360

EFFECTS ON WATER QUALITY WHEN DREDGING A POLLUTED HARBOR USING CONFINED SPOIL DISPOSAL,
Marine Resources Lab., Dauphin Island.
E. B. May.
Alabama Marine Resources Bulletin, No 10, p 1-8, May 1974. 1 fig, 2 tab, 12 ref. PL 33-309, Proj 2-216R.

Descriptors: Alabama, *Water quality, *Dredging, Harbors, Dissolved oxygen, Hydrogen sulfide, Spoil banks.
Identifiers: Spoil disposal.

Dredging a polluted harbor using confined spoil disposal did not degrade water quality. Quality of water returned to the waterway was better than that in the stream before or during dredging due to an increase in dissolved oxygen and removal of solids and hydrogen sulfide. There was no significant increase in trace elements. (NOAA)
W75-00381

APPLYING A WATER QUALITY MODEL TO POLLUTION MANAGEMENT: D.O.--B.O.D. IN NARRAGANSETT BAY,
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
M. L. Spaulding, G. A. Brown, and F. M. White.
Rhode Island University Marine Technical Report 26, 1974. 34 p, 18 fig, 9 tab, 13 ref. 04-3-158-3.

Descriptors: *Pollution abatement, *Computer models, *Dissolved oxygen, *Biochemical oxygen demand, *Water quality, *Water pollution, Coasts, Management, Tidal effects, Seasonal variations, *Rhode Island.
Identifiers: *Narragansett Bay(Rhode Island), Temperature effects, Storm-sewage overflow, *Pollution prevention, Sea grant program.

Simulations with the computer model of the reaction scheme for the B.O.D.-D.O. system have displayed the model's ability to predict reasonable vertical structure definition for D.O. and B.O.D. in typical summertime conditions. In addition, variations over a tidal cycle show expected phase relationships between D.O. and B.O.D. Application of the model to a change in water surface temperature shows reasonable changes in the D.O. levels and lower D.O. values typical in summertime conditions. Predictions using the model for storm-sewage overflow situations have shown a good order-of-magnitude estimate compared to the meager data available for 'excessive load cleanup times.' In addition, projections of the state of D.O. and B.O.D. for Narragansett Bay in 1990 have shown reasonable results and indicate how the model can be used to help in the management of our coastal waters. (NOAA)
W75-00382

MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART VI. CURRENT MEASUREMENTS IN THE OUTER LOS ANGELES HARBOR,
University of Southern California, Los Angeles. Allan Hancock Foundation.
For primary bibliographic entry see Field 2L.
W75-00384

RESOURCE EVALUATION STUDIES ON THE MATAGORDA BAY AREA, TEXAS,
Texas A and M Univ., College Station.
W. M. Ahr, J. Daubenspeck, H. W. Harry, T. G. Littleton, and B. Holliday.
Texas A and M University Sea Grant College Publication TAMU-SG-74-204, September 1973. 166 p, 1 append. 04-3-158-18.

Descriptors: *Water circulation, *Pesticides, *Land use, *Coasts, *Bays, *Water pollution effects, Polychlorinated biphenyls, Chlorinated hydrocarbon pesticides, Benthos, Pollution, Management, Economics, Resources, *Texas.
Identifiers: Environmental impact, Coastal zone management, Microfauna, Water use, Sea grant program.

This study was designed to furnish information to the General Land Office of Texas (GLO) to help develop an informational base upon which coastal zone management policy guidelines could be made. The contributors were charged with finding answers to the following: (1) What are the water circulation patterns of Matagorda Bay and how does water circulation affect processes such as coastline change and pollution dispersal among others; (2) What is the chronic pesticide and PCB (polychlorinated biphenyls) level in bay sediments and what are the physical-chemical variables that govern the distribution and retention of chlorinated hydrocarbons in the sediments; (3) What are the occurrences and distribution patterns of selected benthic microfauna and will data on microfaunal populations elucidate processes of coastal change, pollution and water circulation; and (4) What is the economic structure of the Matagorda Bay area and how may changes in population, resources and transportation affect its future economic structure. (NOAA)
W75-00386

MANAGING SHELLFISH RESOURCES UNDER INCREASING POLLUTION LOADS,
New York State Dept. of Environmental Conservation, Albany. Div. of Marine and Coastal Resources.
For primary bibliographic entry see Field 5C.
W75-00389

TWO-DIMENSIONAL FINITE ELEMENT MODELING OF TRANSIENT FLOW IN REGIONAL AQUIFER SYSTEMS - ANALYSIS OF GROUNDWATER FLOW IN RELATION TO WATER QUALITY IMPROVEMENT,
Michigan State Univ., East Lansing. Dept. of Civil Engineering.
D. C. Wiggert.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 855 $5.25 in paper copy, $2.25 in microfiche. Completion Report, Institute of Water Research, Michigan State University, East Lansing, August 1974. 99 p, 31 fig, 1 tab, 23 ref, 4 append. OWRT A-067-MICH(1), 14-31-0001-3822.

Descriptors: *Aquifers, Recharge, Groundwater, *Computer models, *Groundwater movement, *Water quality, *Finite element analysis, *Artificial recharge, *Regional analysis, Path of pollutant, Water pollution sources.
Identifiers: Water quality management, Recharged conditions, Regional aquifer systems.

In order to effectively monitor and manage aquifers subjected to artificial recharge as well as increased pumping demands, it becomes necessary to analyze their hydrodynamic response. In this study, a regional two-dimensional flow analysis is formulated using finite-element techniques. A general algorithm is described to handle a variety of regional situations including steady or unsteady and confined or unconfined flow. The advantages of using finite element analysis for aquifer flows become evident when attempting to model irregular boundaries and variable inputs such as recharge, pumping and field properties. Numerical solutions are presented, which when compared with known analytical results show some limitations of the model. Particular emphasis is given to analysis of flow in the aquifer underlying the Michigan State University Water Quality Management Facility, a site where time variable pumping and artificial recharge is to occur. This study is a preliminary step toward the ultimate goal of predicting and monitoring water quality in the system.
W75-00426

CHANGES IN THE AMOUNT AND PROPORTIONS OF DDT AND ITS METABOLITES, DDE AND DDD, IN THE MARINE ENVIRONMENT OFF SOUTH CALIFORNIA, 1949-72,
National Marine Fisheries Service, LaJolla, Calif. Southwest Fisheries Center.
For primary bibliographic entry see Field 5C.
W75-00442

DEGRADATION OF METHYL PARATHION BY MICROORGANISMS OCCURRING IN SURFACE WATER AND SEWAGE,
National Inst. of Hygiene, Warsaw (Poland). Dept. of Communal Hygiene.
J. Maleszewska.
Polskie Archiwum Hydrobiologie, Vol 21, No 1, p 163-171, 1974. 6 fig, 1 tab, 17 ref.

Descriptors: *Organophosphorous pesticides, *Bacteria, *Biodegradation, Surface water, Sewage, Sewage bacteria, Pesticides, Microbial degradation, Methodology, Laboratory tests, Pseudomonas, Insecticides, Amino acids, Chromatography.
Identifiers: *Methyl parathion, *Bacillus sp.

The disintegration of 0, 0-Dimethyl 0-p-nitrophenyl phosphorothioate by bacteria occurring in the surface water and sewage was investigated. The

study concerned isolated strains from water and sewage and preserved strains. It was established that the degradation of pesticides was due to Bacillus cereus preserved strain, and to Bacillus sp. 8, isolated from sewage. The rate of biodegradation was accelerated by the presence of additional organic compounds in the substratum. (Katz)
W75-00444

INVESTIGATIONS OF THE INFLUENCE OF THE EFFLUENT FROM A CONCENTRATED INDUSTRIAL COMPLEX ON A LARGE RIVER,
Kentucky State Dept. of Fish and Wildlife Resources, Frankfurt.
H. M. Hancock.
Final Report, 1974. 169 p, 19 fig, 18 tab, 3 ref, 3 append.

Descriptors: *Industrial wastes, *Water quality, *Pollutants, *Rivers, *Water pollution, *Organic wastes, *Chemical wastes, Effluents, Shellfish, Fish, Benthos, Aquatic animals, Mollusks, Metals, *Kentucky.

The project encompassed seven objectives as follows: Determination of the distribution of fishes in relation to the influence of industrial effluents; determination of the effects of industrial effluents upon the physical condition of fishes in various portions of the river by field bioassay; determination of water quality of the river upstream and downstream from the industrial complex; determination of the distribution of benthos in relation to the influence of industrial effluents; determination of the chemical composition of bottom sediments in various portions of the river; determination of concentrations of industrial wastes, if any, in benthic flesh and mollusk shell by chemical analyses; and determination of concentrations of industrial wastes, if any, in fish tissues by chemical analyses. Methods and findings are presented in detail in this report. The project, extending from March 1, 1969, to June 30, 1971, was restricted to investigations within the lowermost 22 miles of the Tennessee River extending from Kentucky Dam to mergence with the Ohio River between Owen Island and Livingston Point near Paducah, Kentucky. The chemical complex consisted of six industrial plants all with discharges emerging within a distance of approximately 2.8 miles along the left side of the river. (NOAA)
W75-00479

A SURVEY OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF AN ONSHORE DEEPWATER PORT AT GALVESTON, TEXAS. PART II. ENVIRONMENTAL CONSIDERATIONS,
Texas A and M Univ., College Station. Engineering Experiment Station.
R. W. Hann, Jr., and W. P. James.
Texas A and M University Sea Grant Program, TAMU-SG-74-214, April 1974. 15 fig, 3 tab, 5 ref.

Descriptors: *Ports, *Economics, *Environmental effects, *Oil spills, Pollution, *Water quality, *Texas, Harbors, Channel improvement, Dredging.
Identifiers: *Deepwater ports, Offshore deepwater ports, Onshore deepwater ports, Dredge spoil disposal, Terminals, Sea Grant Program.

Environmental aspects are outlined associated with the proposed deep draft channel from a terminus near Pelican Island to the 100 foot depth contour some 57 miles offshore in the Gulf of Mexico. The report in its present stage of development is in no way a complete environmental assessment of the proposed project. It presents some of the major environmental factors which would be affected by the project and outlines ways that the impact on the environmental components could and should be evaluated. Such environmental modifications can have both environmental costs in the form of environmental degradation or environmental benefits in the form of environmental enhancement. The project also has the potential for environmental pollution from accidental oil spills, dredge spoil disposal and other project activities, which must be considered as environmental degradation and cost. The environmental costs many times exceed the environmental benefits and must be offset by other social or economic benefits to make the project feasible; however, judgments in these areas are beyond the scope of this report, which is confined to technical environmental considerations. (See also W74-03489) (NOAA)
W75-00481

PRIMARY, PHYSICAL IMPACTS OF OFFSHORE PETROLEUM DEVELOPMENTS.
Massachusetts Inst. of Tech., Cambridge. Dept. of Ocean Engineering.
Sea Grant Program, MITSG 74-20, Index No 74-820-Nwm. Report to Council on Environmental Quality, April 1974. 443 p, 206 fig, 28 tab, 72 ref, 1 append.

Descriptors: *Continental shelf, *Oil spills, *Oil pollution, *Environmental effects, Weathering, Evaporation, Diffusion.
Identifiers: *Environmental impact, *Petroleum production, Offshore petroleum, Gulf of Alaska, Atlantic Coast, Petroleum transport, Mass transport, Sea Grant Program.

These studies on the initial physical effects of offshore oil development respond to the need for information on potential petroleum production from the Atlantic and Gulf of Alaskan continental shelves. In the first section of this report, written by H.S. Lahman, J.B. Lassiter III, and J.W. Devanney III, a range of hypothetical oil finds is analyzed for the number of platforms and the levels and types of petroleum transport that would be needed. Related to these production activities, the probability of oil spills and spill volume has been determined by J.W. Devanney III and R.J. Stewart. Following this, these researchers, assisted by William Briggs, have hypothesized the expected oil spill trajectories for the Atlantic coast and the Gulf of Alaska. The final section, written by J.B. Lassiter III, R.J. Powers, and J.W. Devanney III, explores the weathering of oil spills in examining the evaporation and diffusion of the lighter components from the slick. In presenting these four studies to the Council on Environmental Quality, the research team has provided important, significant analysis to aid in the assessment of the environmental impact of petroleum production on the continental shelves of the Atlantic coast and the Gulf of Alaska. (NOAA)
W75-00486

WINTER CONDITIONS IN LAKE ERIE WITH REFERENCE TO ICE AND THERMAL STRUCTURE AND COMPARISON TO LAKES WINNEBAGO (WISCONSIN), AND MILLE LACS (MINNESOTA),
State Univ. of New York, Buffalo. Dept. of Biology.
For primary bibliographic entry see Field 2H.
W75-00495

POWER PLANT THERMAL EFFLUENTS IN SOUTHEASTERN LAKE ONTARIO,
State Univ. Coll., Oswego, N.Y. Dept. of Earth Sciences; State Univ., Coll., Oswego, N.Y. and Lake Ontario Environmental Lab.
E. E. Chermack, and T. A. Gallotta.
In: Proceedings of 16th Conference Great Lakes Research, p 663-674, 1973. 9 fig, 3 tab, 6 ref.

Descriptors: *Powerplants, *Effluents, *Thermal pollution, *Seasonal variation, *Water pollution sources, Water resources, Data acqusition, Lakes, Water temperature, *Lake Ontario.
Identifiers: Power generation.

Analysis of data taken by an airborne infrared thermometer over the past two years are presented. The geographical region of coverage includes power plant sites along Lake Ontario's south shore from west of Rochester to the Mexico Bay area in New York. This area is currently being developed to become a major power generation corridor in the next ten years. Data include detailed surface thermal structure in the immediate vicinity of four power plant outfalls as well as thermal structure of large areas of the lake adjacent to and lakeward of the outfalls in order to provide baseline data. Attempts to obtain data in all seasons have been made and this collection thus contains data from every month of the year. Particularly, analysis has centered on the size, shape and behavior of the effluent pools under varying wind, lake current and seasonal conditions plus the ambient or background thermal field. The data were interpreted in the light of the current New York State guidelines for thermal effluents. Preliminary results indicate the need for further elaboration or revision of these guidelines, if they are to be applied to large lakes. (NOAA)
W75-00496

5C. Effects Of Pollution

EFFECT OF A HYPOLIMNION DISCHARGE ON GROWTH OF BLUEGILL (LEPOMIS MACROCHIRUS) IN THE SAVANNAH RIVER, GEORGIA,
Georgia Univ., Athens. School of Forest Resources.
R. G. Dudley, and R. T. Golden.
Available from the National Technical Information Service, Springfield, Va. 22161 as PB-236 589 $3.75 in paper copy, $2.25 in microfiche. Georgia Environmental Resources Center, Atlanta, Report No. ERC-1274, August 1974. 28 p, 8 fig, 5 tab, 31 ref. OWRT B-057-GA(1) 14-31-0001-3569.

Descriptors: *Hypolimnion, Reservoirs, Fish, *Warm-water fish, *Stream fisheries, *Water temperature, Streams, Water quality, *Sunfishes, *Georgia, Water pollution effects.
Identifiers: *Fish growth, *Savannah River(Ga).

Information was sought on the impact of the temperature and overall quality of water released from reservoirs on downstream fish populations. The particular emphasis was on the effects of cool discharges on the growth and condition of bluegill (Lepomis macrochirus), a warm water species. Two stations on the Savannah River, 2.4 and 40 km below Hartwell Dam, were sampled. For comparison with comparable streams without reservoirs, one station on the North Oconee River and one station on the Broad River were also sampled. The mean temperature of the Savannah River was about 5 degrees C below the temperature of the control streams, and temperature drops as rapid as 11 degrees C in five hours occurred in the Savannah River. Growth increments of each fish, calculated from length and scale data, indicated that growth differences between the two control streams were greater than differences between the Savannah and the control streams. In general, neither growth nor condition was significantly affected by the hypolimnion discharge. Apparently, other differences among the four locations were great enough to mask any effect of temperature on growth. The kinds of differences and their probable effects are discussed.
W75-00002

HYDROBIOLOGICAL INVESTIGATIONS OF A BRICK POOL SOUTH OF VIENNA, AUSTRIA (HALLATEICH), (IN GERMAN),
For primary bibliographic entry see Field 2H.
W75-00009

POLLUTIONAL PROBLEMS AND RESEARCH NEEDS FOR AN OIL SHALE INDUSTRY,
Robert S. Kerr Environmental Research Lab., Ada, Okla.
For primary bibliographic entry see Field 5B.
W75-00012

THE CONSTRUCTION AND MANAGEMENT OF SANDPIT LAKES IN THE WESTERN AREA OF THE NETHERLANDS,
South Holland Provincial Waterboard, The Hague (Netherlands).
For primary bibliographic entry see Field 5B.
W75-00093

DETERMINATION OF ZINC AND CADMIUM IN ENVIRONMENTALLY BASED SAMPLES BY THE RADIOFREQUENCY SPECTROMETRIC SOURCE,
Oak Ridge National Lab., Tenn.
For primary bibliographic entry see Field 5A.
W75-00107

INHIBITION OF INTER-MICROBIAL PREDATION BY CHLORINATED HYDROCARBONS,
Harvard Univ, Cambridge. Lab. of Applied Microbiology.
F. Walsh, and R. Mitchell.
Nature, Vol 249, No 5448, p 673-674, June 14, 1974. 1 tab, 6 ref.

Descriptors: *E. coli, *Chlorinated hydrocarbon pesticides, *Predation, *Inhibition.
Identifiers: Chemotactic response.

The rate of kill of Escherichia coli by marine predators in the presence of 2,4-dichlorophenoxyacetate (2,4-D) and o,o-dichlorobiphenyl has been examined. The predators were isolated from seawater by repeated subculture in artificial seawater using E. coli as the sole carbon source. The resulting predators displayed positive chemotaxis to E. coli; the observed changes in E. coli kill rates between lower and higher chlorinated hydrocarbon concentrations are the result of inhibition or excitation of the chemotactic response in the marine predators of E. coli. Several attempts were made to isolate a single predator species from the mixed predator culture; in every case a mixed culture resulted when the isolates were reinoculated into artificial seawater with E. coli as the sole carbon source. (Sandoski-FIRL)
W75-00116

STUDY ON SUBACUTE TOXICITY OF CARBON N-HEXANE-ACETONE EXTRACT RECOVERED FROM DRINKING WATER,
Kyoto Municipal Hygienic Lab. (Japan).
S. Maruoka, T. Nishio, and S. Kawai.
Bulletin of Environmental Contamination and Toxicology, Vol 11, No 6, p 545-550, 1974. 3 tab, 5 ref.

Descriptors: *Toxicity, *Potable water, Organic compounds, Analytical techniques, Laboratory animals, Animal physiology, Public health, Water pollution effects, *Separation techniques, Pollutant identification.
Identifiers: *Japan(Kyoto), *Carbon n-hexane-acetone extraction.

The subacute toxicity of organic substances present in the tap water of Kyoto using a carbon-n-hexane-acetone extraction (CHAE) method has been investigated. A preliminary acute toxicity study showed that the po LD50 value of CHAE was over 5 g/kg body weight, althoughit was difficult to determine the exact value because of its high viscosity. The body weight, food consumption, and organ weights of mice after three months of the dietary regimens showed no significant differences between control and test groups. The gross and histological examinations revealed no abnormalities attributable to CHAE. From these results is presumed that the amounts consumed by citizens may cause no adverse effects on health. (Sandoski-FIRL)
W75-00120

DYNAMICS OF THE VEGETATION IN THE EUTROPHIC MARSHES OF THE GIURGEU DEPRESSION, (IN RUMANIAN),
Babes-Bolyai Univ., Cluj (Rumania).
F. Ratiu.
Stud Univ Babes-Bolyai Ser Biol, Vol 18, No 1, p 15-20, 1973, Illus.

Descriptors: *Plant succession, Romania, *Marshes, Vegetation, Grasslands, *Eutrophication.
Identifiers: *Romania.

Spatial variation, among other factors of location, determines the dynamics of the vegetation within the limits of certain series of succession at this Romanian locality. The water factor is decisive, its lasting presence above and within the substratum modify the characteristics of this layer, lack of aeration of hydromorphic soils, their poor thermal conductivity, pH changes, pedogenic processes which result in the formation of eutrophic and mesotrophic peat. These associations may be thought of as divergent successive eutrophic and mesotrophic series. Both high and low sedge cenoses dominate the vegetation and semi-cultivated grassy meadows centrifugally surround the eutrophic marshes, with ligneous vegetation in the form of woody meadows and insular cenoses.--Copyright 1974, Biological Abstracts, Inc.
W75-00135

OBSERVATIONS ON WATER MOVEMENT, CHEMICAL LAYERING AND FISH MIGRATIONS IN VARZEA-LAKES AT THE MIDDLE SOLIMOES (RIVER AMAZON), (IN GERMAN),
Instituto Nacional de Pesquisas da Amazonia, Manaus (Brazil).
U. De M. Santos.
Oecologia (Berl), Vol 13, No 3, p 239-246, 1973, Illus. English summary.

Descriptors: South America, Rivers, *Lakes, Fish, Fishkill, Fish behavior, *Fish migration, Water levels, Spawning.
Identifiers: Brazil(Amazon River), Epilimnion, Hypolimnion, Solimoes, *Varzea lakes(Brazil).

The regularly inundated region of the middle Amazon river (Brazil) together with its marginal lakes is characterized by special hydrographic, hydrochemical and biological conditions. Regular investigations of such 'Varzea' lakes revealed several correlations between changes in water level, thermal and chemical layering of the water and fish behavior. Starting in Aug., the lakes begin to dry out. Consequently large amounts of plant material from floating plant mats undergo decomposition. The rising of the water level in the Solimoes (R. Amazon) which begins in Dec., fills the lagoons with Wei (Beta)-wasser. This leads to rich primary production in the uppermost layer whereas the layers at the bottom become heavily reduced in O2. Special weather conditions (persistent winds from the south) may cause a complete mixing of the epi- and hypolimnion, accompanied by an abnormal drop in air and water temperature ('friagem'). Thus water poor in O2 and rich in H2S is brought to the surface causing typical signs of asphyxia in all fish and even mass mortality in some species. Fish living in the Varzea lakes show a conspicious migration pattern related to the change of wet and dry periods. Spawning migrations from the lakes into the Solimoes in the starting phase of the inundation period (February-April) are caused by the better oxygenated spawning grounds in the river and the utilization of the rich food sources in the floating plant masses. Back migration of adult fish (a few days after spawning) and of the growing fry (during the subsequent period of high water) is caused by utilization of the rich terrestrial food sources in the Igapos (= inundated forest). Mass migration from the Igapos and lakes in the dry season (Sept.) is due to the decrease in space and food supply. The rich primary production in the newly filled lakes causes gradual back migration from the river at the beginning of the wet season (Dec.-Jan.).--Copyright 1974, Biological Abstracts, Inc.
W75-00136

BIOLOGICAL AND BACTERIOLOGICAL INVESTIGATIONS OF A SLIGHTLY POLLUTED SURFACE WATER (DANUBE) AND OF A HIGHLY POLLUTED SURFACE WATER (SZILAS CREEK) (BIOLOGIAI ES BAKTERIOLOGIAI VIZSGALATOK EGY KISSE SZENNYEZETT (DUNA) ES EGY EROSEN SZENNYEZETT (SZILAS-PATAK) FELSZINI VIZFOLYASBAN),
For primary bibliographic entry see Field 5B.
W75-00168

THE APPLICATION OF SOME ELECTROCHEMICAL METHODS TO THE MEASUREMENT OF PHOTOSYNTHESIS AND RESPIRATION IN FRESH WATERS,
Freshwater Biological, Association, Ambleside, (England).
For primary bibliographic entry see Field 5A.
W75-00171

HEAVY METALS AND OTHER TRACE ELEMENTS,
Illinois Univ., Urbana.
For primary bibliographic entry see Field 4C.
W75-00198

MARINE AND ESTUARINE POLLUTION,
California State Univ., Long Beach. Dept. of Biology.
For primary bibliographic entry see Field 5B.
W75-00200

AQUATIC SEDIMENTS,
Massachusetts Univ., Amherst.
For primary bibliographic entry see Field 5B.
W75-00201

MICROBIAL FOULING OF THE PIPES OF WATER COOLERS UPON THE APPLICATION OF POLLUTED CANAL WATER,
Ghent Rijksuniversiteit (Belgium). Dept. of General and Industrial Microbiology.
J. P. Voets, H. Vansteen, and W. Verstraete.
Materials and Organisms, Vol 9, No 1, p 1-12, 1974. 6 fig, 1 tab, 12 ref.

Descriptors: *Fouling, Microbiology, Industrial plants, Aquatic microorganisms, Chlorophyta, Cyanophyta, Aerobic bacteria, Protozoa, Investigations, Cooling water.
Identifiers: *Water coolers, Colonization, Biocides.

The microbial phenomena governing the fouling of industrial once-through water coolers has been studied. The fouling processes were initiated by the attachment to the walls of the cooler pipes of a film of zoogloeal and filamentous organisms. Upon this initial colonization phase follows a logarithmic secondary colonization phase characterized by the accumulation of a wide variety of Chlorophyta, Cyanophyta, Bacillariophyta, and Protozoa. Practical methods which inhibit on a long term basis these fouling processes are not available, but alternative shock treatment of the cooling water with biocides retard these processes considerably. (Sandoski-FIRL)
W75-00204

MOLYBDENUM AND FISH,
Industrial Water Engineering, Vol 11, No 3, p 6, May/June, 1974.

Descriptors: *Molybdenum, *Laboratory tests, *Sunfishes, *Rainbow trout, *Channel catfish, *Toxicity.
Identifiers: *Fathead minnows.

Results of extensive tests to determine the effects of water-soluble molybdenum on several varieties of fish have been announced. The fish species tested were bluegill, rainbow trout, fathead minnows, and channel catfish. The amount of active ingredient toxic to 50 percent of the specimens for all species ranged from 6500 to greater than 10,000 ppm, the highest concentration tested. The level at which no adverse symptoms were observed varied from 2400 ppm for bluegill to 7500 ppm for channel catfish. (Sandoski-FIRL)
W75-00207

SALINITY PROBLEMS OF ORGANISMS IN COASTAL AREAS SUBJECT TO THE EFFECT OF ENGINEERING WORKS,
Gulf Coast Research Lab., Ocean Springs, Miss.
G. Gunter, B. S. Ballard, and A. Venkataramaiah.
Available from NTIS, Springfield, Va 22161 as AD-775 761, Price $7.00 printed copy, $2.25 microfiche. Army Engineer Waterways Experiment Station, Contract Report H-73-3, December 1973. 176 p, 7 tab, 342 ref. Army Contract DACW39-72-C-0003 and DACW73-70-C-0004.

Descriptors: *Estuaries, *Salinity, *Ecology, *Estuarine environment, *Coastal engineering, Dredging, Floods, Electrolytes, Estuarine fisheries, Water pollution effects.

The relationships to salinity of all phyla of animals living in the coastal waters are reviewed, with emphasis on the estuaries of the Gulf coast and Atlantic coast of the United States, areas particularly influenced by coastal engineering works and the changes of salinity they cause. Seasonal or irregular floods and drought periods, resulting in severe osmotic changes, may kill organisms or result in drastic changes of the biota, which may take extended time to reestablish if the conditions return to normal. In general, the worms and molluscs are more often osmoconformers than the crustaceans. In general the effects of salinity and other environmental limits act upon the reproductive stages or the young. Coastal engineering projects have the effect of modifying the composition and distribution of living organisms. Although general guide lines for evaluating their effect may be set up, every estuary is a complex ecological entity and each must be studied as carefully as possible. Predictions of possible effects must be based on specific knowledge of the particular area involved. (Knapp-USGS)
W75-00240

NUTRIENT TRANSPORT AND DISSOLVED OXYGEN BUDGET STUDIES IN THE POTOMAC ESTUARY,
Environmental Protection Agency, Annapolis, Md. Annapolis Field Office.
For primary bibliographic entry see Field 5B.
W75-00243

THE PROTOZOA OF MOBILE BAY, ALABAMA,
University of South Alabama, Mobile.
E. E. Jones.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 793, $5.25 in paper copy, $2.25 in microfiche. University of South Alabama Monographs, Vol 1, No 1, May 1974. 115 p, 2 charts, 30 plates, 87 ref. OWRT A-021-ALA(1).

Descriptors: *Protozoa, *Alabama, Surveys, *Food webs, Food chains, Ecology, Ecosystems, Water pollution effects, Estuaries, Biota, Systematics.
Identifiers: *Mobile Bay(Ala), Plant protoplasm, Animal protoplasm, Biotope.

Mobile Bay is the third largest drainage basin in the United States. As is true for any estuary, the ecology of the Bay is influenced by pollution, salinity, temperatures, turbidity, tides and the biotic populations. Since protozoa lie at the food web and feed on diatoms, algae, bacteria and each other, they form a major transition point at which plant protoplasm is converted to animal protoplasm. Because of their basal position in the food web, they must be successful in the biotope before most of the higher forms can be successful. For this reason a survey of the protozoa of Mobile Bay was undertaken. The scale drawings and taxonomic descriptions will be of great value to protozoologists. (Warman-Auburn)
W75-00262

METABOLIC CAPABILITIES OF SULFUR OXIDIZING BACTERIA AND THEIR ROLE IN WATER POLLUTION,
Kentucky Univ., Lexington. Water Resources Research Inst.
For primary bibliographic entry see Field 5B.
W75-00270

PREDICTING POLLUTION IN THE JAMES RIVER ESTUARY: A STOCHASTIC MODEL,
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Statistics.
For primary bibliographic entry see Field 5B.
W75-00273

ROLE OF PHOSPHORUS IN EUTROPHICATION,
National Environmental Research Center, Corvallis, Oreg.
A. F. Bartsch.
Copy available from GPO Sup Doc as EP1.23:72-001, $0.55; microfiche from NTIS, Springfield, Va 22161 as PB-228 292, $2.25. Environmental Protection Agency, Ecological Research Series Report EPA-R3-72-001, August 1972. 45 p, 4 fig, 14 tab, 94 ref. EPA Program Element 328201.

Descriptors: *Eutrophication, *Nutrients, Primary productivity, Trophic level, *Phosphorus, *Detergents, *Sewage, Municipal wastes, *Water pollution control.

The process of eutrophication is a natural one, often accelerated greatly by man's activities that contribute nutrients. The key nutrient is phosphorus. Although there is no simple relationship, it is clear that increasing phosphorus content frequently leads to accelerated eutrophication. Of all important nutrients, phosphorus is most controllable. Sources of phosphorus include runoff from undisturbed agricultural and urban lands; waste from watercraft; industrial and domestic wastes; biological sources; and precipitation. Also, the most important single source is municipal sewage, fortunately, the most potentially controllable of all inputs. Control efforts follow five basic directions: Limiting fertility; improving food webs; stimulating plant diseases and parasites; recycling nutrient-laden water to agricultural and forest lands; and using toxic chemicals to kill vegetation. Limitation of nutrients is the most desirable approach, particularly through curtailing phosphorus inputs. (EPA)
W75-00276

ORDINATION OF SOME LITTORAL BENTHIC COMMUNITIES IN BEAR LAKE, UTAH-IDAHO,
California Univ., Berkeley. School of Forestry and Conservation.
D. C. Erman.
Oecologia (Berl), Vol 13, No 3, p 211-226, 1973, Illus.

Descriptors: *Utah, *Idaho, *Lakes, Invertebrates, *Benthos, Sediments, Silts, Clays, Oligotrophy.
Identifiers: *Bear Lake(Utah-Idaho), Tanytarsus.

Bottom invertebrate communities were compared along the western shoreline of a large oligotrophic lake (Bear Lake, Utah-Idaho). A technique of community ordination was used for the comparisons. Ordination indicated that differences among stations were associated with local differences in bottom type. The bottom type was apparently influenced by isolation from lake currents, nutrient additions and increased amounts of fine sediments and organic matter. The amount of silt + clay was the most important sediment factor affecting the invertebrate communities. Most communities were dominated by a small species of larval chironomid, Tanytarsus.--Copyright 1974, Biological Abstracts, Inc.
W75-00322

SECULAR VARIATION OF OXYGEN CHANGE IN THE DEEP WATER OF LAKE BIWA, (IN JAPANESE),
K. Naka.
Jap J Limnol, Vol 34, No 1, p 41-43, 1973, Illus. English summary.

Descriptors: *Dissolved oxygen, Eutrophication, Lakes, *Oligothrophy, Water pollution effects.
Identifiers: *Japan(Lake Biwa).

Lake Biwa in Shiga Prefecture (Japan) is in an oligotrophic condition. The results of limnological observations made by the Shiga Prefecture Fisheries Experiment Station for 40 yr since 1931 show that the amounts of O2 dissolved in the deep water before the seasonal circulation have been changing as follows: 6.64 cc/l in 1931, 5.26 cc/l on the average from 1950-1959, 4.39 cc/l on the average for 9 yr since 1931, and in 1969 the amount became the smallest value of 3.25 cc/l. Such results suggest that there has been a tendency to a progressed eutrophication of Lake Biwa during the past 40 yr.--Copyright 1974, Biological Abstracts, Inc.
W75-00340

ON THE EFFECT OF THE PLANNED DANUBE POWER PLANTS ON THE HYDROFAUNA OF CZECHOSLOVAKIAN SECTION OF THE DANUBE, (IN GERMAN),
Vyskumny Ustav Vodohospodarsky, Bratislava (Czechoslovakia).
J. Rothschein.
Zb Slov Nar Muz Prir Vedy. Vol 19, No 1, p 79-97. 1973. Illus.

Descriptors: *Powerplants, Dredging, Aquatic organisms.
Identifiers: *Czechoslovakia(Danube River).

The rapid regression of Acipenseridae and the total disappearance of Huso huso in the northern and central Danube during the 19th century may have been due to dredging operations and changes in the current which destroyed their spawning grounds. Because of the rate of flow, the river bed is constantly changing, allowing no organisms time to form except when the water level is low. Chironomidae and Oligochaeta have been reported under these circumstances. Biotopes are divided into 3 categories: those constantly covered with water, those temporarily covered, and those moistened by waves. When the rate of flow slows, a stable substrate is allowed to form, increasing the habitational area for Ephemeroptera, Trichoptera, Amphipoda, Hirudinea and Mollusca, and in especially slow areas, Hypania invalida has even appeared. Mass development of Dreissensia polymorpha is also possible, causing difficulties in technical installations. Different biotope, soil, banks, vegetation, and current combinations and their typical fauna are listed. Potential changes in the Czechoslovakian Danube are based on observations of the Austrian section, where power in-

stallations have already been constructed.--Copyright 1974, Biological Abstracts, Inc.
W75-00342

ANAEROBIC METABOLISM IN LAKE WASHINGTON SEDIMENTS,
Auburn Univ., Ala. Dept. of Fisheries.
M. M. Pamatmat, and A. M. Bhagwat.
Limnol Oceanogr. Vol 18, No 4, p 611-627. 1973. Illus.

Descriptors: *Lake sediments, Benthos, *Anaerobic bacteria, *Washington, *Metabolism, Oxygen demand.
Identifiers: *Lake Washington.

A method of measuring the dehydrogenase activity of sediments (benthic community: heterotrophic bacteria, fauna) at 10C was calibrated by direct microcalorimetry at the same temperature. Field measurements of dehydrogenase activity of sediments in Lake Washington, Washington, were converted to rates of metabolic heat release by means of the significant regression of dehydrogenase activity on metabolic heat release. Simultaneous field measurements at 10C of O2 uptake by undisturbed sediment cores were converted to rates of metabolic heat release by the factor 4.8 cal liberated/ml O2 consumed. Dehydrogenase activity varies from place to place and differs between layers of the same core. Although there is a general trend of decreasing activity with sediment depth, some subsurface layers have relatively high activity. Dehydrogenase activity, which was detected down to the deepest layers of the sediment cores, 21-31 cm, appears to be more a function of plankton remains than of total organic C in the sediment. The integrated metabolic heat release based on dehydrogenase activity of the entire core was invariably greater than the metabolic heat release calculated from the rates of O2 uptake. Thus, it appears that the rate of total O2 uptake by the sediment surface underestimates benthic community metabolism in the sediment column.--Copyright 1974, Biological Abstracts, Inc.
W75-00344

COMPARATIVE PRODUCTIVITY OF FOUR CAROLINA LAKES,
Du Pont de Nemours (E. I.) and Co., Aiken, S. C. Savannah River Lab.
L. J. Tilly.
Am Midl Nat. Vol 90, No 2, p 356-365. 1973. Illus.

Descriptors: *Primary productivity, Lakes, *South Carolina, Carbon-14, Absorption, Limnology, Stratification, Temperature, Turbidity.

Field data for 14C uptake in 2 reservoirs, a Carolina bay and an oxbow in South Carolina, indicate that lakes of this region are low in primary productivity compared to lakes elsewhere for which published values are available. Par Pond, a reactor-cooling reservoir, is the only lake studied which shows even moderate productivity. Factors which may be related to productivity in these lakes include nutrient level, water temperature, light penetration as influenced by turbidity and water color, and stratification as influenced by local topography and lake morphometry. Limnological characteristics of the 4 South Carolina lakes are summarized.--Copyright 1974, Biological Abstracts, Inc.
W75-00345

SURVIVAL OF SCLEROTIA OF RHIZOCTONIA SOLANI IN LAKE WATER,
Florida Univ., Gainesville. Dept. of Plant Pathology.
T. E. Freeman.
Plant Dis Rep. Vol 57, No 7, p 601-602. 1973. Illus.

Descriptors: *Water hyacinth, Lakes, *Pathogens, Water pollution effects.
Identifiers: *Rhizoctonia solani, *Sclerotia.

Sclerotia of an isolate of Rhizoctonia solani pathogenic to water hyacinth (Eichhornia crassipes) survived for 26 mo. when submerged in nonsterile lake water. Cultures derived from submerged sclerotia maintained a degree of pathogenicity equal to that of the original culture.--Copyright 1974, Biological Abstracts, Inc.
W75-00348

INFLUENCE OF THE CREATION OF ARTIFICIAL LAKES OF THE GREAT AFRICAN BARRAGES ON PARASITIC ENDEMICS: A COMPARATIVE STUDY OF AKOSOMA LAKE ON BLACK VOLTA AND NASSER LAKE ON THE NILE (EGYPT, SUDAN),
Institut Pasteur, Paris (France). Laboratoire d'Epidemiologie.
R. Deschiens.
Bull Soc Pathol Exot. Vol 65, No 2, p 240-263. 1972. (English summary).

Descriptors: *Lakes, *Parasites, Eutrophication, Oligotrophy.
Identifiers: *Akosoma lake, Bilharziases, *Egypt, *Endemics, Malaria, *Nasser lake, Nile, Onchocerciasis, Sudan, Volta.

A comparative study of Akosombo and Nasser lakes from the ecologic and epidemiologic viewpoint with relation to the great parasitic endemics transmitted by water vectors, reveals 2 different situations. Akosombo lake is an eutrophic lake system, in full production, situated in a warm and damp area, with a luxuriant vegetation and a relatively high demographic density; in this environment pathogenic complexes, particularly, malaria, bilharzioses and onchocercoses, are solidly implanted and, fortunately, well controlled from the sanitary viewpoint. Lake Nasser corresponds to a still oligotrophic lake system, with a low production, situated in a arid and desert-like region, with a reduced plant and animal population, and a low human density (Assouan excepted). Pathogenic complexes, particularly malaria, bilharzioses, onchocercosis, are very attenuated (bilharziosis), or potential, but constitute a threat for the future and the parasitoses under study are endemic in the Nile valley, as well above as below the lake. Egyptian health services exercise a very efficient epidemic and prophylactic control on these potentialities. As to the coordination of economic (industry, agriculture), technical (geology, engineering), and public health (epidemiology, prophylaxis) projects related to the construction of the great barrages and their lakes in warm and tropical regions, it is possible to choose the site of a barrage only as a function of the various possibilities. The role of the Sanitary Service begins during the barrage construction, to ensure the medical security of the workmen and leaders. It will afterwards exercise the nosologic, epidemiologic and prophylactic supervision over the constructed territory.--Copyright 1974, Biological Abstracts, Inc.
W75-00351

DETERMINATION OF GENERATION TIME AND PRODUCTION OF BACTERIOPLANKTON BY MODIFICATION OF THE TECHNIQUE OF CLOSED VESSELS, (IN RUSSIAN),
T. F. Imeshkenova, and B. A. Shishkin.
Mikrobiologiya. Vol 42, No 3, p 542-545. 1973. Illus. English summary.

Descriptors: *Plankton, Eutrophication, Bioassay.
Identifiers: *Cladocera, *Copepoda, Rotatoria, *USSR(Lake Kenon).

The generation time, production and consumption of bacterioplankton by cladocera, copepoda, and rotatoria were determined by means of a modification of the closed vessel technique in the reservoir of the Chita state regional election power plant and eutrophic lake Kenon (USSR) in June-Aug 1971. The results are correlated with hydrobiological indices. Parallel determination by the technique of Razumov-Ivanov and by the modification of Romanenko assay demonstrated the advantage of the latter technique.--Copyright 1974, Biological Abstracts, Inc.
W75-00354

DRINKING WATER LITHIUM AND MENTAL HOSPITAL ADMISSIONS,
Baylor Coll. of Medicine, Houston, Tex. Dept. of Psychiatry.
A. D. Pokorny, D. Sheehan, and J. Atkinson.
Dis Nerv Syst. Vol 33, No 10, p 649-652. 1972.

Descriptors: *Potable water, *Psychological aspects, Behavior, Hospitals.
Identifiers: Admissions, Disorders, Human, *Lithium, Mental, Neurosis, Personality, Psychosis.

Dawson et al. speculated that naturally occurring Li exerts a measurable and statistically significant influence on the incidence of patients admitted to State Mental Hospitals and on certain categories of mental illness, i.e. psychosis, necrosis and personality disorders. The present report finds no direct or causative relationship existing between drinking water Li and mental hospital admissions.--Copyright 1973, Biological Abstracts, Inc.
W75-00363

UPPER SUWANNEE RIVER, EVALUATION OF A PROPOSED DRI AS AN AREA OF CRITICAL STATE CONCERN, COLUMBIA AND HAMILTON COUNTIES, FLORIDA.
Florida Div. of State Planning, Tallahassee. Bureau of Land Planning.
For primary bibliographic entry see Field 4A.
W75-00372

RESOURCE EVALUATION STUDIES ON THE MATAGORDA BAY AREA, TEXAS,
Texas A and M Univ., College Station.
For primary bibliographic entry see Field 5B.
W75-00386

A SYSTEM FOR THE DETERMINATION OF CHRONIC EFFECTS OF POLLUTANTS ON THE PHYSIOLOGY AND BEHAVIOR OF MARINE ORGANISMS,
Florida State Univ., Tallahassee. Dept. of Biological Science.
R. J. Livingston, C. R. Cripe, C. C. Koenig, F. G. Lewis, III, and B. D. DeGrove.
Florida Sea Grant Program Report No 4, July 1974. 18 p, 7 fig, 12 ref. 04-3-158-43.

Descriptors: *Water pollution effects, *Monitoring, *Marshes, *Estuaries, *DDT, *Pollutants, *Pesticides, Aquatic animals, Physiology, Animal behavior, Habitats, Water quality, Marine fish.
Identifiers: *Avoidance reaction, Chronic effects, Mirex, Sea grant program.

An experimental system was set up to facilitate the use of high quality sea water in experiments concerned with the chronic effects of pollutants on the behavior and physiology of selected marine organisms. This system can be used to determine quantitative changes in behavior under closely controlled conditions. By utilizing a sound proof controlled environment room, there is a minimal amount of outside distraction for the experimental organisms. The closed circuit television allows continuous monitoring in such undisturbed surroundings, and is used effectively for rapid quantification of behavioral data. With this system, it is hoped that more can be learned about the long-term sublethal effects of pollutants on the behavior of key estuarine and coastal organisms so that another dimension can be added to our understanding of the significance of pesticide residues found in natural populations. (NOAA)
W75-00388

MANAGING SHELLFISH RESOURCES UNDER INCREASING POLLUTION LOADS,
New York State Dept. of Environmental Conservation, Albany. Div. of Marine and Coastal Resources.
A. C. Jensen.
Proceedings of 26th Annual Session of Gulf and Caribbean Fisheries Institute, held New Orleans, Louisiana, October 1973, p 173-180, July 1974. 2 fig, 3 tab, 7 ref. Also as Div. Marine and Coastal Resources, Contrib No 74-4.

Descriptors: *Shellfish farming, *Pollution, *Aquaculture, *Water quality, *Domestic wastes, *Farm wastes, *Industrial wastes, Management, Sewage, Bacteria, Resources, Pesticides, Heavy metals, New York(State).
Identifiers: *Pollution abatement, *New York Bight, Long Island Sound.

Those charged with the management of marine shellfish resources are faced with the problem of how to maintain usable production in the face of environmental pressures. This is a summary of the case of New York State's prosperous shellfish industry. Of the 16.3 million pounds of hard clams produced in the U.S. in 1972, New York was the source of more than 52% of them. In 1972, the state's shellfish industry harvested 8.5 million pounds of hard clams (Mercenaria mercenaria) worth $13.2 million at the dockside. In addition, the industry harvested 1.1 million pounds of American oysters (Crassostrea virginica). Most of the bivalve shellfish were harvested from approximately 425,000 acres of underwater land controlled by the state of New York. At the present time, about 24% are closed because the waters do not meet criteria established for the certification of shellfish growing areas. Various sources of pollution are identified: farm wastes, domestic sewage, storm water runoff, pesticides; and heavy metals. Methods of dealing with this problem are set forth. (NOAA)
W75-00389

EFFECT OF NITRATE IN DRINKING WATER ON REPRODUCTIVE AND PRODUCTIVE EFFICIENCY OF DAIRY CATTLE,
Wisconsin Univ., Madison. Dept. of Dairy Science, and Wisconsin Univ., Madison. Dept. of Agricultural Engineering.
J. W. Crowley, N. A. Jorgensen, L. W. Kahler, L. D. Satter, and W. J. Tyler.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 854 $4.25 in paper copy, $2.25 in microfiche. Wisconsin Water Resources Center, Madison, Technical Completion Report, September, 1974. 45 p, 11 tables, 85 ref. OWRR A-048-WIS(1), 14-31-0001-3850, 14-31-0001-4050.

Descriptors: *Fertilizers, *Nitrites, *Water Quality, Farms, Ruminants, *Reproduction, *Dairy industry, *Nutrient requirements, *Nitrates, Potable water, Water pollution effects.

The long term effect of high nitrate stock water intake on reproductive and productive performance of dairy cattle was investigated. A 54-cow herd was divided into control (drinking water contained 19.3 ppm nitrate) and treatment (drinking water contained 374 ppm nitrate from added potassium nitrate) groups. The investigation was conducted over a 35-month period. During the first 20 months, there were no significant differences in reproductive performance between groups as measured by incidence of abortions, retained placentas, cystic ovaries, services, conceptions, services per conception or percent first service conception. During the last 15 months, the only significant difference between groups was a higher services per conception (1.71. vs. 1.18) and a lower percent first service conception (42.9 vs. 73.1) for the nitrate group. There were no significant differences in milk production or composition per milking day; however, total production was slightly lower for the nitrate group because of a longer dry period, thought to be a result of delayed conception for the nitrate group. No differences in blood hemoglobin, methemoglobin, vitamin A, carotene, vitamin E or liver vitamin A were observed. The only significant nitrate influence, therefore, was a reduction in first service conception and an increase in services per conception.
W75-00428

THE EFFECT OF CHLORINATION ON TILAPIA FISH,
Mekorot Water Co. (Israel). B. C. Nesin Water Quality Lab.
Y. Eren, and Y. Langer.
Bamidgeh, Vol 25, No 2, p 56-60, June 1973. 4 tab, 6 ref.

Descriptors: *Chlorine, *Toxicity, *Fishkill, *Tilapia, Freshwater fish, Laboratory tests, Temperature, Bioassay, Water pollution effects.
Identifiers: Chloramines, Hypochlorites, Residual chlorine, *Israel.

The effect of different concentrations of chlorine on Tilapia aurea was tested in order to determine whether chlorine was the lethal agent in fishkills. Small tilapias (3-5g) were sensitive to chlorine concentrations above 0.5 mg/l. Larger fish were able to withstand concentrations to 1 mg/l. Prolonged exposure sensitized the fish to residual chlorine. Tilapia were more sensitive to free residual chlorine (hypochlorites) than to combined residual chlorine (chloramines). It was decided that residual chlorine was not the principal cause of fish mortality in Israel National Water Systems reservoirs, although other factors could act synergistically. (Katz)
W75-00431

EFFECTS OF OIL AND EMULSIFIERS ON EGGS AND LARVAE OF NORTHERN PIKE (ESOX LUCIUS) IN BRACKISH WATER,
Univ. Turku (Finland). Archipelago Research Inst.
K. Hakkila, and A. Niemi.
Aqua Fennica, p 44-59, 1973. 4 fig, 1 tab, 28 ref.

Descriptors: *Oil wastes, *Emulsifiers, *Larvae, *Fish eggs, *Pikes, *Surfactants, *Toxicity, Brackish water, Mortality, Temperature, Resistance, Water pollution Sources, Growth stages, Laboratory tests, Methodology, Lethal limit, Physiology, Respiration, Environmental effects, Water pollution effects.
Identifiers: *Northern Pike, Esox lucius, Neste A, Talestol, Corexit, TLm, Floating oil, Sublethal effects.

The effects of Russian crude oil and some emulsifiers on the eggs and larvae of Northern Pike (Esox lucius) in brackish water (salinity 5.8%) were studied experimentally Neste A (emulsifier), Talestol (surfactant), crude oil dispersed with Neste A, and contact with floating oil increased the mortality of eggs during development. Dissolved fractions of oil had no effect on the mortality rate. All substances increased the occurrence of abnormal larvae. Neste A, Talestol, and dispersed oil were toxic to pike larvae; dissolved fractions, Corexit 8666, and BP 1100 had no acute effects. High temperatures increased the toxicity of emulsifiers. The resistance of pike larvae varied greatly at different stages of development. (Katz)
W75-00432

THE EFFECT ON FISH ON THE MASS DEVELOPMENT OF BRACKISH WATER PLANKTON,
Finnish Pulp and Paper Research Inst., Helsinki.
O. Seppovaara.
Aqua Fennica p 118-129, 1971. 3 fig, append, 23 ref.

Descriptors: *Brackish water, *Odor-producing algae, *Organoleptic properties, *Eutrophication, Microscopy, Nutrients, Algae, Commercial Fish, Plankton, Chlorophyta, Phosphorous, Salinity, Diatoms, Cyanophyta, Odor, Water pollution sources, Laboratory tests.
Identifiers: Melosira, Oscillatoria.

The occurrence of unpleasant odor and taste in commerically important fish was believed to be caused by eutrophication induced by nutrients from waste waters. Examination of the algae reveal 19 odiferous groups. Although the total cell count was less than that in control aquaia, the abundance of Melosira and Oscillatoria was sufficient to give the water a characteristic odor and taste. Tainting was further enhanced by the effect of decomposing algae on the bottom. (Katz)
W75-00433

OLFACTORY ELECTRO ENCEPHALOGRAPHIC RESPONSES OF HOMING COHO SALMON, ONCORHYNCHUS KISUTCH, TO WATER CONDITIONED BY CONSPECIFICS,
National Marine Fisheries Service, Honolulu, Hawaii. Southwest Fisheries Center.
A. E. Dizon, R. M. Horrall, and A. D. Hasler.
Fishery Bulletin, Vol 71, No 3, p 893-896, July 1973. 1 fig, 1 tab, 7 ref.

Descriptors: *Anadramous fish, *Fish behavior, *Streams, *Migration, Salmon, Methodology, Juvenile fish.
Identifiers: *Homing, *Coho salmon, *Electrocencephalographic Responses, Oncorhynchus kisutch, Conditioned water, Olfactory imprinting.

Olfactory responses of coho salmon were tested in an attempt to differentiate between responses to conditioned home-stream water (other conspecifics were present) and responses to 'pure' home-stream water. Results indicate that an intense and specific response to home-stream water is not necessarily indicative of juvenile olfactory imprinting and that further investigations are needed. (Katz)
W75-00434

THE INFLUENCE OF DISCHARGED HEATED WATER FROM THE POWER STATION AT SKAWINA ON MICROFLORA OF VISTULA RIVER,
Panstowowy Instytut Hydrologiczno-Meterologiczny, Wroclaw (Poland).
A. Solski.
Polskie Archiwum Hydrobiologie, Vol 21, No 1, p 75-82, 1974. 7 fig, 5 ref.

Descriptors: *Thermal pollution, *Heated water, *Bacteria, *Thermophilic bacteria, Water pollution effects, Water pollution sources, Power plants, Aquatic animals, Trophic levels, Sediments, Microbiology, E. Coli, Photosynthetic bacteria, Sulfur Bacteria, Nitrogen fixing bacteria, Temperature, Water quality, Nitrogen, Benthos, Fungi.
Identifiers: *Poland(Vistula River).

The influence of discharged heated water from the power station at Skawina on the occurrence of microorganisms in water and bottom sediments of Vistula River was studied. The total number of bacteria, among which psychro-, meso, and thermophilic bacteria were distinguished, as well as some physiological groups of bacteria was investigated. (Katz)
W75-00436

ZOOPLANKTON SPECIES AS INDICATORS OF ENVIRONMENT,
Jyvaskyla Univ. (Finland). Dept. of Biology.
L. Hakkari.
Aqua Fennica, p 46-54, 1972. 7 fig, 3 tab, 21 ref.

Descriptors: *Eutrophication, *Oligotrophy, *Bioindicators, *Zooplankton, Water pollution effects, Pulp wastes, Primary productivity, Smelt, Industrial wastes, Lakes, Predation, Biomass.

Identifiers: Daphnia galatea, Heterocope appendiculata, Planktivorous fish, Vendace.

Zooplankton that are commonly regarded as bioindicators of different conditions were investigated in two lakes in Finland with different levels of pollution. Zooplankton frequencies were determined. Some typical indicators of eutrophy were inhibited by sulphite pulp and paper mill effluents. Some other species were abundant in these areas. Daphnia galatea and Heterocope appendiculata which usually prefer oligotrophy were abundant in these polluted areas. Planktivorous fish can change the distribution of zooplankton species. Vendace and smelt can reduce the amounts of indicators of oligotrophy in unpolluted areas. The ratio of eutrophic and oligotrophic species correlated significantly with the amounts of total phosphorous and primary production. Planktivorous fish had no significant effect on this rate. (Katz)
W75-00437

MACROINVERTEBRATE COMMUNITY STRUCTURE AS AN INDICATOR OF ACID MINE POLLUTION,
Haywood Technical Inst., Clyde, N. C. Dept. of Biological Sciences.
G. Dills, and D. T. Rogers, Jr.
Environmental Pollution, Vol 6, No 4, p 239-261, June 1974. 7 fig, 7 tab, 47 ref.

Descriptors: *Bioindicators, *Benthic fauna, *Acid mine water, *Invertebrates, Turbidity, Regression analysis, Water pollution sources, Water pollution effects, Accidic water, Streams, Hardness(Water), Hydrogen ion concentration, Sulfur, Industrial wastes, Seasonal, Biological communities, Water quality, Statistical models, Topography, Geology, Methodology, Physicochemical properties, Chemical analysis, Stoneflies, Diptera.
Identifiers: *Species diversity, *Macroinvertebrates, Coleoptera.

Physicochemical parameters and benthic macroinvertebrate community structure were quantitatively related to varying degrees of acid mine drainage in a small stream system. Tributaries exposed to acid effluents were characterized by a reduction in turbidity, a decrease in pH and an increase in mineral content. Strong positive correlation existed between hardness, iron, manganese, pH, conductivity, and sulphur. A step-wise regression analysis was performed to disclose the water parameter most closely related to species diversity of the macroinvertebrate community. Hydrogen-ion concentration was highly correlated with species diversity. Significant differences in species diversity existed between strongly acid and less acidic tributaries. Stations located near areas of acid production were consistently lowest in diversity. Species diversity values for the unpolluted stations showed temporal variations with highest values occurring during late March and December. The more acidic stations showed no seasonal trends in deversity values. Varying degrees of acid mine pollution were reflected by changes in the macroinvertebrate community structure. (Katz)
W75-00438

THE DIATOM SUCCESSIONS IN THE RECENT SEDIMENTS AND THE EUTROPHICATION OF RISTISELKA, LAKE PAIJANNE, CENTRAL FINLAND,
Hydrobiological Research Inst., Jyvaskyla (Finland).
K. Granberg.
Aqua Fennica, p 20-27, 1972. 5 fig, 1 tab, 30 ref.

Descriptors: *Eutrophication, *Diatoms, *Sediments, *Succession, Phytoplankton, *Bioindicators, Environmental effects, Domestic wastes, Pulp wastes, Sulfates, Sulfite liquors, Primary productivity, Methodology, Oligotrophy, Hydrogen ion concentration, Sampling, Bottom sampling.
Identifiers: *Finland(Lake Paijanne), Araphidineae.

In order to determine the effects of eutrophication on Lake Paijanne, Finland, diatom succession and communities are examined, in phytoplankton and sediments. Comparisons were made with diatom communities in an environment that approximates the natural state of Lake Paijanne. Eutrophication was caused by domestic wastes and sulfite and sulfate pulp mill effluents. A significant correlation existed between the mean diatom composition of the plankton and the surface sediment. At the beginning of eutrophication, the diversities raised, and then decreased as eutrophication continued. The dominant diatoms were Fragilaria crotonensis and Melosira italica and an increase in Araphidineae further indicated eutrophication. (Katz)
W75-00439

TOXICITY OF VARIOUS FORMULATIONS OF 2,4-D TO SALMONIDS IN SOUTHEAST ALASKA,
Forest Service (USDA), Juneau, Alaska. Forestry Sciences Lab.
W. R. Meehan, L. A. Norris, and H. S. Sears.
Journal of the Fisheries Research Board of Canada, Vol 31, No 4, p 480-485, April 1974. 2 tab, 20 ref.

Descriptors: *Toxicity, *2-4-D, *Juvenile fish, *Salmon, *Rainbow trout, Pesticides, Organic pesticides, Trout, Pink salmon, Chum salmon, Sockeye salmon, Mortality, Herbicides, Bioassay, Methodology, Bioindicators, *Alaska, Water pollution effects.
Identifiers: Oncorhynchus nerka, Salvelinus malma, Salmo gairdneri, Oncorhynchus kisutch, Oncorhynchus keta, Oncorhynchus gorbuscha, Coho salmon, Dolly Varden, PGBE, 2-4-D derivatives, TLm.

To determine the acute toxicity to juvenile (1) pink, chum, coho and sockeye salmon (2) Dolly Varden char, and (3) rainbow trout, 2,4-Dacid, butyl and isoctyl esters were tested in southeast Alaska. Acomparable test was made in Oregon using coho salmon fingerlings. A mean percent mortality after 96 h and the highest concentration of herbicide that did not produce any mortality were determined for each formulation tested. At less than 50 ppm 2,4-D acid produced no mortality except in pink salmon fry. The butyl ester was most toxic causing nearly complete mortality in all species at concentrations > 1.0 ppm and the isooctyl ester least toxic of the ester formulations. Alaskan and Oregon coho fingerlings were similar in their responses to 2,4-D acid, butyl, and isooctyl esters. The toxicities of three different formulations of isooctyl ester, a PGBE ester, and butyl ester to Alaskan coho fingerlings are also determined. There were few or no differences in toxicity among isooctyl ester formulations. The butyl and PGBE esters were similar in toxicity. (Katz)
W75-00440

EFFECT OF AMMONIA AND UREA ON NITROBACTERIA IN WATER ENVIRONMENT,
Wroclaw Technical Univ. (Poland). Inst. of Environmental Protection Engineering.
I. Langowska, and J. Moskal.
Polskie Archiwum Hydrobiologie, Vol 21, No 1, p 119-123, 1974. 2 fig, 7 ref.

Descriptors: *Ammonia, *Urea, *Bacteria, Surface waters, Nitrogen compounds, *Metabolism, Inhibition, Water pollution sources, Toxicity, Water pollution effects, Ammonification, Nitrification, Methodology, Laboratory Tests.
Identifiers: *Nitrobacteria.

The effect of urea and ammonia on nitrobacteria living in water has been studied in order to determine the limit of concentrations inhibiting some metabolic processes. It has been found that nitrobacteria have a high degree of tolerance for ammonia and urea, since fairly high concentrations of the examined compounds, which are seldom used in the surface water, had to be used to produce an effect. Ammonia and urea in the range of 0.1-20g/l show no negative effects on ammonifying and denitrifying bacteria. Ammonia appears to be more toxic than urea in higher concentrations. (Katz)
W75-00441

CHANGES IN THE AMOUNT AND PROPORTIONS OF DDT AND ITS METABOLITES, DDE AND DDD, IN THE MARINE ENVIRONMENT OFF SOUTH CALIFORNIA, 1949-72,
National Marine Fisheries Service, LaJolla, Calif. Southwest Fisheries Center.
J. S. MacGregor.
Fishery Bulletin, Vol 72, No 2, p 275-293, April 1974. 12 fig, 5 tab, 26 ref.

Descriptors: *DDT, *DDD, *DDE, *Oceans, *Water pollution effects, Biota, Absorption, Pesticides, Chlorinated hydrocarbon pesticides, Environmental effects, *California, Fish, Plankton, Aroclor, Polychlorinated biphenyls, Pesticide residues, Chromatography, Methodology, Sewage.
Identifiers: *Bioaccumulation, Stenobrachius leucopsarus, Myctophids.

The contamination of the ocean and its biota off southern California by DDT is discussed. The accumulation of DDT and its metabolites in the ocean are described for 1949 to 1972, especially as they are reflected in the myctophid fish, Stenobrachius leucopsarus. This time period was characterized by continuous dumping of DDT wastes into the ocean by a large manufacturer of DDT, and the cessation of this dumping in 1970. Aspects and implications of the pesticide pollution problem in the marine environment are discussed. (Katz)
W75-00442

DEGRADATION OF METHYL PARATHION BY MICROORGANISMS OCCURRING IN SURFACE WATER AND SEWAGE,
National Inst. of Hygiene, Warsaw (Poland). Dept. of Communal Hygiene.
For primary bibliographic entry see Field 5B.
W75-00444

CHRONIC TOXICITY OF NTA (NITRILOTRIACETATE) AND METAL-NTA COMPLEXES TO DAPHNIA MAGNA,
National Water Quality Lab., Duluth, Minn.
K. E. Biesinger, R. W. Andrews, and J. W. Arthur.
Journal of the Fisheries Research Board of Canada, Vol 31, No 4, p 486-490, April 1974. 1 fig, 3 tab, 11 ref.

Descriptors: *Nitrilotriacetic acid, *Hardness(Water), *Chelation, *Toxicity, *Bioassay, Water pollution sources, Chemical wastes, Daphnia, Zooplankton, Lethal limit, Zinc, Metals, Iron, Methodology, Laboratory tests, Water quality, Reproduction, Water pollution effects.
Identifiers: LC50.

The chronic toxicity of NTA (nitrilotriacetate) tested as the trisodium salt, to Daphnia magna in eight natural waters varied tenfold. A strong negative correlation between water hardness and NTA toxicity was found; NTA was most toxic in water with a total hardness of 22 mg/liter and was least toxic in water with a total hardness of 438 mg/liter. The 21-day LC50 in all cases closely approximated the calculated molar equivalence point of total hardness and NTA. Bioassay experiments of NTA, with copper and zinc added, confirmed earlier reports that chelates of copper and zinc with NTA are relatively non-toxic. The solutions are toxic only when the metals or NTA were

present in excess. The toxicity of iron (III) was not appreciably changed by NTA chelation. (Katz)
W75-00446

THE EFFECTS OF HEAVY METAL IONS ON THE MOTILITY OF SEA URCHIN SPERMATOZOA,
Emory Univ., Atlanta, Ga. Dept. of Physiology.
L. G. Young, and L. Nelson.
Biological Bulletin, Vol 147, No 1, p 236-246, August 1974. 4 fig, 1 tab, 16 ref.

Descriptors: *Heavy metals, *Zinc, *Copper, *Manganese, *Mercury, *Fertilization, Methodology, Reproduction, Sea water, *Ions, Enzymes, Inhibitors, Biochemistry, Chelation, Bioassay, Water pollution effects.
Identifiers: Arbacia punctulata, *Sea urchins, *Spermatozoa, Swimming rates, *Motility, EDTA.

The effects of alterations of concentrations of heavy metals in the environment of Arbacia punctulata spermatozoa are quantitatively explored using swimming speed as a criterion of evaluation. Swimming speed was determined through the use of a colorimeter. Different concentrations of zinc, copper, manganese and mercury were utilized. Results indicate that optimum motility of sea urchin spermatozoa for a period adequate to initiate fertilization requires a critical level of certain heavy metal ions. Increase of some of the divalent cations above 'normal' seawater concentrations accelerates or depresses the swimming speed in dose- or time-dependent fashion (or both). Differences in rate of penetration into the cell, binding of active groups or selective inhibition of enzymes by the ions may account for differences in swimming speed response patterns. Concentrations tested ranged from 500 nM to 10 mM with the optimum concentrations falling between 1 to 10 micromolar Cu, Zn and Hg, while Mn was mildly inhibitory at these levels. EDTA, up to 0.0001 molar, exerts no adverse effect on sperm propulsion, while 8 x 0.0001 M almost completely blocks motility. The EDTA appears not only to bind essential seawater cations, but may also deplete intracellular regulatory cations. (Katz)
W75-00447

EFFECT OF ZOOPLANKTON GRAZING ON THE FORMATION OF THE ANOXIC LAYER IN TOKYO BAY,
Tokyo Univ., (Japan). Ocean Research Inst.
H. Seki, T. Tsuji, and A. Hottori.
Estuarine and Coastal Marine Science, Vol 2, No 2, p 145-151, April 1974. 4 fig, 9 ref.

Descriptors: *Zooplankton, *Oxygen sag, *Red tide, *Organic matter, Phytoplankton, Oxygen, Eutrophication, Hypolimnion, Dissolved oxygen, Oxygen demand, Methodology, Sampling, Water quality, Stratification, Copepods, Food chains, Nutrients, Water pollution effects.
Identifiers: *Anoxia, Phytodetritus, Flagellates, *Japan(Tokyo Bay).

The contribution of herbivorous zooplankton to formation of the anoxic zone in the bottom layer was studied during the summer and early autumn while a red tide occurred in an area of coastal water of Tokyo Bay. Phytodetritus and faecal pellets produced by copepod grazing on flagellates of the red tide formed a major fraction of organic debris sedimenting from the surface layer to the bottom layer. The production of this organic debris was insignificant when the phytoplankton densities were lower than 1.5 g of carbon/m3 or 4.0 g of nitrogen/m3. (Katz)
W75-00448

EFFECTS OF AN OIL SPILL REMOVER ON BEACH MEIOFAUNA,
Queen's Univ., Belfast (Northern Ireland). Dept. of Zoology; and Queen's Univ., Belfast (Northern Ireland). Marine Biology Station.
R. J. Bleakley, and P. J. S. Boaden.
Annales de L'Institut Oceanographique, Vol 50, No 1, p 51-58, 1974. 4 fig, 9 ref.

Descriptors: *Oil spills, *Adsorption, *Surfactants, *Intertidal areas, *Toxicity, Pollution abatement, Water pollution treatment, Water pollution effects, Water pollution sources, Oil pollution, Oil, Sands, Methodology, Nematodes, Bacteria, Colorimetry, Analytical techniques, Detergents, Mortality, Environmental effects.
Identifiers: *Oil spill remover, *Meiofauna, Lissapol.

The effects of an oil spill remover (80% nonyl/octyl phenol ethylene oxide condensate; 20% methyl cyclohexanol) and the surfactant alone, on the meiofauna of intertidal sand were examined. The meiofauna apparently survives the effects of diluted detergent because of molecular adsorption by the sands grains, but concentrations in excess of 100 ppm are toxic. Spraying of beaches contaminated by oil spills probably produces such concentrations. The meiofauna recovers very slowly because of the persistence of detergent in the sand. The long term effects on the meiofauna are not influenced by the state of the tide at the time when the detergent is applied. (Katz)
W75-00449

EFFECTS OF EXPOSURE TO TIME-EXCESS TEMPERATURE HISTORIES TYPICALLY EXPERIENCED AT POWER PLANTS ON THE HATCHING SUCCESS OF FISH EGGS,
Johns Hopkins Univ., Baltimore, Md. Chesapeake Bay Inst.
J. R. Schubel.
Estuarine and Coastal Marine Science, Vol 2, No 2, p 105-116, April 1974. 4 fig, 5 tab, 21 ref.

Descriptors: *Fish eggs, *Temperature, *Powerplants, Fish reproduction, Herring, Cooling water, *Thermal pollution, Laboratory tests, Environmental effects, Resistance, Growth stages, Fish physiology, Methodology, Perches, Striped bass, Fish, Statistical methods, Water pollution effects.
Identifiers: *Hatching success, Shad, Alewifes, Alosa aestivalis, Morone saxatilis.

Blueback herring, alewife, American shad, white perch and striped bass eggs were subjected to time-temperature histories typically experienced by organisms that are either carried through the once-through cooling system of a power plant, or are entrained into the thermal plume without passing through the plant. The maximum excess temperature tested ranged from 6-10C and the time of exposure to a maximum delta T from 2.5-60 min. The period of cooling to the final temperature ranged from 60-300 min. For each species, six to eight experiments were run on six to twelve subsamples of 200-400 eggs from a single female. Several different stages of development were tested. Analyses of variance showed that for each species the differences in hatching success among the various time-temperature treatments, including the control treatment, were not significant at the 1% level. Further, for each species the mean hatching success of the controls did not differ significantly from the mean hatching successes associated with any of the experimental time-temperature treatments. Results suggest that exposure of fish eggs of the species and development stages tested to these time-temperature histories does not significantly affect their hatching success. (Katz)
W75-00450

EFFECTS OF THE INSECTICIDE CARBARYL ON CLAMS AND SOME OTHER INTERTIDAL MUD FLAT ANIMALS,
Oregon State Univ., Newport. Marine Science Center.
D. A. Armstrong, and R. E. Millemann.
Journal of the Fisheries Research Board of Canada, Vol 31, No 4, p 466-469, April 1974. 1 fig, 1 tab, 14 ref.

Descriptors: *Pesticides, *Clams, *Toxicity, Juvenile growth stage, Mollusks, Resistance, Mortality, Biocontrol, Shrimp, Insecticides, Stress, Mud flats, Aquatic animals, Methodology, Commercial fish, Fishkill, Crabs.
Identifiers: *Carbaryl, Gaper clam, Bent-nosed clam, Tresus capax, Macoma nasuta, Callianassa californiensis, 1-naphthol.

The insecticide carbaryl significantly reduced numbers of juvenile clams in plots treated with 2.3 and 4.6 kg/acre. Pooling of samples taken at 1, 2, 4, 15 and 30 days after treatment showed mean clam numbers per m sq in untreated and treated plots were 364, 283, and 224, respectively, the reductions from the controls being 22% and 38%. Clam species differed in susceptibility to carbaryl; for example, numbers of the gaper clam (Tresus capax) were reduced by 58% and 69% at the low and high application rates in relation to those from the control plots, and the bent-nosed clam (Macoma nasuta) by 9% and 28%. There was no reduction in numbers of polychaete and nemertean worms. A carbaryl application of 2.3 kg/acre was as effective in controlling ghost shrimp (Callianassa californiensis), an oyster pest, as 4.6 kg/acre. Signs of stress and numbers affected are given for other mud flat animals. (Katz)
W75-00451

EFFECT OF COMPLEXATION ON TOXICITY OF COPPER TO FISHES,
Montana State Univ., Bozeman. Fisheries Bioassay Lab.
G. K. Pagenkopf, R. C. Russo, and R. V. Thurston.
Journal of the Fisheries Board of Canada, Vol 31, No 4, p 462-465, April 1974. 2 tab, 18 ref.

Descriptors: Copper, *Toxicity, *Ions, *Alkalinity, Copper compounds, Equations, Equilibrium, Water properties, *Hydrogen ion concentration, Hardness(Water), Bioassay, Alkalis(Bases), Methodology, Minnows, Rainbow trout, Resistance, Magnesium, Metals, Heavy metals, Calcium, Water pollution effects.
Identifiers: *Copper(II), Pimephales promelas, Salmo gairdneri.

Copper is highly complexed by carbonate and hydroxide ions in natural waters and this complexation determines the concentration of copper species in solution. Results of detailed equilibrium calculations on data from bioassays where alkalinity, pH, hardness, and total copper concentrations are different indicate that copper (II) is the chemical species that is toxic to fishes and that alkalinity is the factor controlling copper (II) concentration. (Katz)
W75-00452

DURATION OF TOXICITY TESTS FOR ESTABLISHING 'NO EFFECT' CONCENTRATIONS FOR COPPER WITH BROOK TROUT (SALVELINUS FONTINALIS),
National Water Quality Lab., Duluth, Minn.
J. M. McKim, and D. A. Benoit.
Journal of the Fisheries Research Board of Canada, Vol 31, No 4, p 449-452, April 1974. 3 tab, 4 ref.

Descriptors: *Brook trout, *Copper, *Toxicity, *Bioassay, Growth rate, Reproduction, Resistance, Growth stages, Juvenile fish, Absorption, Methodology, Spawning, Water pollution effects.
Identifiers: Salvelinus fontinalis, Tissue analysis, Accumulation, Sublethal effects, Hatchability.

Exposure of brook trout to sublethal concentrations of copper from yearlings through spawning to 3-month juveniles was found sufficient to establish a 'no-effect' concentration. No adverse effects were found on survival, growth or reproductive capacity of trout exposed in a second generation from egg through spawning to copper concentrations (about 9.4, 6.1 and 4.5 micro g/liter)

which had caused no adverse effects on their parents when exposed to similar concentrations from yearlings to spawning. There were no adverse effects found on survival or growth of their offspring when exposed to the same concentrations from hatching to age 90 days. Tissue residue analyses indicated no copper accumulation in gill, liver, kidney or muscle of either first- or second-generation trout exposed to the various copper concentrations, and residues in unfertilized eggs from exposed females were similar to those in females not exposed to added copper. (Katz)
W75-00453

ACUTE TOXICITY OF TWENTY INSECTICIDES TO STRIPED BASS, MORONE SAXATILIS,
National Marine Fisheries Service, Tiburon, Calif. Tiburon Fisheries Lab.
S. Korn, and R. Earnest.
California Fish and Game, Vol 60, No 3, p 128-131, July 1974. 2 tab, 8 ref.

Descriptors: *Insecticides, *DDD, *DDT, *Endrin, *Striped bass, *Toxicity, *Bioassay, Chlorinated hydrocarbon pesticides, Juvenile fish, Toxicants, Lethal limit, Sea water, Heptachlor, Aldrin, Dieldrin, Analytical techniques, Water pollution effects.
Identifiers: Morone saxatilis, TL50, Endosufan, Dursban, Carbaryl, Abate, Methoxychlor, Toxaphene, Lindane, Chlordane, Malathion, Parathion, E.P.N., Fenthion, Dibrom, Intermittent flow bioassay.

The acute toxicity of twenty insecticides to juvenile striped bass was determined in saline water. All bioassays were four-day tests using proportional diluters. Endrin, Endosulfan, DDT, and Dursban were the most toxic with Median Lethal Concentration (TL50) values of less than 1 micro g/l. Carbaryl and Abate were the least toxic with TL50 values over 1,000 micro g/l. DDD, Heptachlor, Methoxychlor, Toxaphene, Aldrin, Lindane, Chloradane, Malathion, Parathion, Dieldrin, E.P.N., Fenthion, Dibrom, and Methyl Parathion were also tested and are listed in order of decreasing toxicity. Some advantages of intermittent versus static bioassay testing are discussed. (Katz)
W75-00454

EVALUATION OF PHILODINA ACUTICORNIS (ROTIFERA) AS A BIOASSAY ORGANISM FOR HEAVY METALS,
Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Biology; and Virginia Polytechnic Inst. and State Univ., Blacksburg. Center for Environmental Studies.
A. L. Buikema, Jr., J. Cairns, Jr., and G. W. Sullivan.
Water Resources Bulletin, Vol 10, No 4, p 648-661, August 1974. 1 fig, 1 tab, 68 ref.

Descriptors: *Rotifers, *Heavy metals, *Bioindicators, *Toxicity, Aquatic microorganisms, Zooplankton, Bioassay, Cadmium, Chromium, Cobalt, Copper, Lead, Mercury, Nickel, Zinc, Metals, Hardness(Water), Sunfishes, Food web, Methodology, Toxicants, Mortality, Channel catfish, Trout, Phenols, Ammonium compounds, Water pollution effects.
Identifiers: Philodina acuticornis, Silver, EC50, Lepomis macrochirus, Carrassius auratus, Salmo ssp., Salvelinus ssp.

A technique for using the rotifer Philodina acutocornis as a bioassay organism is described. The rotifer was exposed to a range of concentrations of 14 toxicants. The effects of cadmium, chromium, cobalt, copper, lead, mercury, nickel, silver, and zinc were studied. Based on 96 h exposure in soft water the sensitivity of the rotifer to the metals from most toxic to least toxic was: cadmium mercury and copper, zinc, silver, nickel (chloride), chromium, nickel (sulfate), lead and cobalt. In hard water with 96 h exposure the most to least toxic were: cadmium, copper, mercury, chromium and lead. The 48 h EC50 suggests that zinc will follow mercury in relative toxicity when Philodina is tested in hard water. Increased water hardness decreased the toxicity of the heavy metals studied. The results suggest that this rotifer may be more sensitive than the bluegill sunfish to the salts of cadmium, copper, nickel, zinc and chromium and less sensitive to lead. Data for cobalt, silver and mercury are not available. Philodina was extremely tolerant of ammonium chloride and phenol. The feasibility and economics of using an inexpensive, readily cultured and available organism such as Philodina as a bioassay organism were discussed. (Katz)
W75-00455

ON THE EFFECTS OF METHYL MERCAPTAN AND ITS OXIDATION PRODUCTS ON AQUATIC MICROBES AND FISH,
Jaakko Poyry and Co., Helsinki (Finland).
P. Hynninen.
Aqua Fennica, p 154-165, 1971. 3 fig, 4 tab, 33 ref.

Descriptors: *Sulfur compounds, *Pulp wastes, *Lethal limit, *Toxicity, *Microbial degradation, Fish, Aquatic animals, Sulfur, Industrial wastes, Water pollution sources, Publications, Water pollution effects, Environmental effects, Organic wastes, Sulfates, Degradation(Decomposition), Enzymes, Inhibitors, Biochemistry, Aquatic bacteria, Algae, Chemistry, Amino acids, Laboratory tests, Bioassay, Statistical models, Toxicants.
Identifiers: *Methyl mercaptan, *Dimethyl sulfide, Dimethyl disulfide.

The effects of methyl mercaptan, dimethyl sulfide and dimethyl disulfide on aquatic micro-organisms and fish were studied using a literature survey and several tests as a basis. In Finland, considerable amounts of the sulfur compounds studied are discharged through the waste waters of sulfate pulp mills. The amount of sulphur contained in them can be estimated to be about 0.5-1.0 kg S per ton of pulp. Small amounts of methyl mercaptan and its oxidation products are also formed as a result of microbial activities in the degradation of organic matter. During five-day tests the minimum lethal concentration of methyl mercaptan was found to be about 0.5 mg/l. Tests indicated that methyl mercaptan and dimethyl sulfide are clearly more poisonous than dimethyl sulfide. Toxicity has been observed to be caused by the inhibiting capacity of enzymes containing sulfur compounds. (Katz)
W75-00456

THE EFFECT OF WASTE WATER ON FISH,
National Water Board of Finland, Helsinki.
P. Heinonen, and P. Falck.
Aqua Fennica, p 105-110, 1971. 1 fig, 5 tab, 6 ref.

Descriptors: *Eutrophication, *Perches, *Waste water(Pollution), *Productivity, Commercial fishing, Primary productivity, Freshwater, Water quality, Algae, Sewage, Dissolved oxygen, Pulp wastes, Water pollution effects.
Identifiers: *Fish productivity, Perca fluviatilis, Acerina cernua, Leuciscus rutilus, Fish quality, Roaches, Vendace, *Finland(Lake Saimaa).

The effect of waste water on the stock of fish in recipient lakes has been studied by means of test fishing, carried out during the summer of 1966 and 1967 in Lake Saimaa, Finland. Tests proved that waste water has a beneficial effect on catches but lowers the quality of the fish as a result of eutrophication. Perches in particular seem to be very sensitive to changes. The ruff (Acerina cernua) and the roach (Leuciscus rutilus) are clearly benefiting from the eutrophication. (Katz)
W75-00457

INVESTIGATIONS OF THE INFLUENCE OF THE EFFLUENT FROM A CONCENTRATED INDUSTRIAL COMPLEX ON A LARGE RIVER,
Kentucky State Dept. of Fish and Wildlife Resources, Frankfurt.
For primary bibliographic entry see Field 5B.
W75-00479

EFFECT OF SPOIL DISPOSAL ON BENTHIC COMMUNITIES NEAR THE MOUTH OF DELAWARE BAY,
Delaware Univ., Coll. of Marine Studies.
D. Maurer, R. Biggs, W. Leathem, P. Kinner, and W. Treasure.
Report DEL-SG-4-74, January 1974. 234 p, 22 fig, 17 tab, 99 ref, 1 append.

Descriptors: *Benthos, *Dredging, *Estuaries, Delaware River, Invertebrates, Ecology, Marine biology, Spoil banks, Marine geology, Flushing.
Identifiers: Coastal zone, *Delaware Bay, Benthic communities, Suspended sediment, Sea Grant Program.

Gross biological effects of dredging and overboard spoil disposal in Breakwater Harbor, Lewes, Delaware on benthic marine invertebrates was evaluated. Information was compiled on physical oceanography, marine geology and marine biology. Four bathymetric surveys were carried out. Descriptions are given for the tides and currents; salinity, water temperature, water chemistry and trace metals in sediments. It was found that most of the spoil moved out of the proposed spoil site down a slope 90 meters toward an enclosed basin. Macrobenthic invertebrate assemblages were examined and results are shown in tabular form. There was a significant reduction in density of benthos after dredging. The abundance of Nucula proxima and Tellina agilis declined significantly at the disposal site after dredging. Reduction in density and community disruption was restricted to the dredge and areas of spoil accumulation. The period of least harm to benthos would be between December and March. At the bay mouth flushing probably helped to reduce the damage to benthos from oxygen depletion and suspended sediment. (NOAA)
W75-00484

POTENTIAL BIOLOGICAL EFFECTS OF HYPOTHETICAL OIL DISCHARGES IN THE ATLANTIC COAST AND GULF OF ALASKA,
Massachusetts Inst. of Tech., Cambridge. Dept. of Civil Engineering.
S. F. Moore, G. R. Chirlin, C. J. Puccia, and B. P. Schrader.
Sea Grant Program, Report to Council on Environmental Quality, Report No MITSG 74-19, Index No 74-819-Cwm, April 1, 1974. 204 p, 10 fig, 46 tab, 165 ref.

Descriptors: *Oil spills, *Oil pollution, *Aquatic environment, *Aquatic habitats, *Biological communities, *Water pollution sources, Ecosystems, Aquatic fauna, Aquatic flora, Toxicity.
Identifiers: *Biological effects, *Pollution sources, *Gulf of Alaska, United States East Coast, Marine environments, Petroleum hydrocarbons, Hydrocarbons, Petroleum, Ecological equilibrium, Population/community response, Environmental impact.

This report is an analysis of the primary biological effects of potential oil discharges resulting from hypothetical oil production activity on the Atlantic/Alaskan OCS. Although emphasis is placed on analysis of impacts and recovery from large-volume infrequent accidental oil spills, small volume continuous discharges of hydrocarbons are also considered. Effects of oil releases from offshore platforms and spills occurring at coastal terminals are assessed. Qualitative predictions are attempted which are a rough order of magnitude estimates of physical, chemical and biological changes likely to occur due to oil releases into the

marine environment. The study consists of several principal parts: (1) an environmental inventory; (2) a summary of response and sensitivity of individual organisms to petroleum substances; (3) an analysis of population/community level responses to oil, especially population recovery from accidental spills; and (4) an assessment of potential effects of specific oil discharges associated with hypothetical OCS petroleum developments. (NOAA)
W75-00485

SUSCEPTIBILITY TO CRUDE OIL WITH RESPECT TO SIZE, SEASON AND GEOGRAPHIC LOCATION IN MYTILUS CALIFORNIANUS (BIVALVIA),
University of Southern California, Los Angeles. Allan Hancock Foundation.
R. Kanter.
Sea Grant Publication No. USC-SG-4-74, 1974. 43 p, 30 fig, 3 tab, 20 ref.

Descriptors: *Water pollution effects, *Oil pollution, *Oil spills, *Mussels, *Mortality, Mollusks, Shellfish, Invertebrates, Intertidal areas, *California, Environmental effects, Drilling.
Identifiers: Crude oil, Oil production, Offshore drilling, Mytilus californianus Conrad, Pelecypoda.

Mytilus californianus Conrad from Pismo Beach, Coal Oil Point, Palos Verdes and Santa Catalina Island, California were exposed to Santa Barbara crude oil under laboratory conditions. The oil dispersed into two phases both of which contacted the mussels directly; an emulsified phase of small globules and a soluble or partitioned phase. Six two-month studies spanning twelve months were conducted. The animals were maintained in a constant environment chamber at 15 deg C plus 1 deg. Mytilus californianus succumbed faster and in higher numbers in higher concentration of crude oil than in the lower concentrations. Larger experimental animals from Pismo Beach, Coal Oil Point and Santa Catalina exhibited significantly higher mortalities than their smaller counterparts. The two most susceptible populations were from Pismo Beach and Santa Catalina Island. Each population had different months of highest mortalities, with no encompassing seasonal pattern for all groups. No correlation between periods of highest mortality and spawnings was detected. (NOAA)
W75-00494

SEDIMENTATION OFF THE KEWAUNEE NUCLEAR POWER PLANT,
Wisconsin Univ., Green Bay. Coll. of Environmental Sciences.
J. M. Pezzetta.
Wisconsin University Sea Grant College Technical Report, WIS-SG-74-221, March 1974. 68 p, 14 fig, 1 tab, 44 ref, 3 plates, 3 append.

Descriptors: *Nuclear power plants, *Powerplants, *Sediment transport, Lakes, Coasts, Sedimentation, Lake Michigan, Water pollution effects.
Identifiers: *Nearshore environments, *Environmental impact, *Jet flow, *Discharged cooling water, *Coastal zone.

A comparative two-year study of the nearshore sedimentary environment of Lake Michigan was undertaken to provide basic information on the physical characteristics of the lake bottom and beach zone in the vicinity of the condenser cooling water discharge flume of the Kewaunee Nuclear Power Plant located near Two Creeks, Wisconsin. The pre-operational data have indicated that the sedimentary processes operative along this segment of the lakeshore are controlled largely by a shallow, hard, clay-covered, dolomitic bedrock promontory which forms an extension of the point of land upon which the plant has been constructed. Wave action and wind-driven currents are the principal mechanisms by which the sediments are redistributed along the littoral zone in a general southerly direction. Monitoring of the sediment field and adjacent shoreline after the plant is in operation should indicate whether the jet flow of discharged cooling water will adversely affect the natural sedimentary processes operative in the near-shore environment. (NOAA)
W75-00499

PRELIMINARY EFFECTS ON ALGAL SUCCESSION RESULTING FROM NUTRIENT ENRICHMENT OF TWO CENTRAL VIRGINIA PONDS WITH DIFFERENT TROPHIC STATES,
Virginia Commonwealth Univ., Richmond. Dept. of Biology.
H. J. Winfrey, and G. L. Samsel.
Castanea. Vol 38, No 2, p 140-152, 1973.

Descriptors: *Algae, *Ponds, *Virginia, *Eutrophication, Phytoplankton, Lakes, Succession, Water pollution effects.
Identifiers: Carbon-14.

The effect of nutrient enrichment (accelerated eutrophication) on algal succession was studied in 2 adjacent, morphologically similar central Virginia ponds with different trophic states (one already receiving animal waste effluent was eutrophic, the other unenriched pond was oligotrophic). A comparison of phytoplankton development and nutrient levels in the 2 ponds was established prior to the diversion of effluent wastes into the oliogotrophic pond. The eutrophic pond's higher trophic status appeared to have been induced by sewage effluent. Each pond contained a distinctive algal flora; the organically enriched waters of the eutrophic pond supported large populations of blue greens, coccoid green algal, and flagellates while the nutrient poor oligotrophic pond contained lower numbers of phytoplankton and paucity of filamentous green algae, desmids, pennate diatoms and dinoflagellates. After diversion of wastes into the as yet unenriched oligotrophic pond, the ponds were closely monitored to observe changes in algal flora and trophic levels. Throughout the study the biological productivity of both lakes was determined periodically by measuring 14CO2 uptake, total extractable chlorophyll, and the relative dominance of the algal genera in order to evaluate changes in trophic status.--Copyright 1974, Biological Abstracts, Inc.
W75-00517

ON THE CHLOROCOCCAL FLORA OF FINLAND: III. EKENAES-TVAERMINNE REGION: 2. OEREN, (IN GERMAN),
For primary bibliographic entry see Field 2H.
W75-00526

AN UNUSUAL OOMYCETE INFECTING ROTIFER EGGS,
Ohio State Univ., Columbus. Dept. of Botany.
R. L. Seymour, and T. W. Johnson, Jr.
Mycologia. Vol 65, No 4, p 944-948, 1973, Illus.

Descriptors: *Rotifers, Fish diseases, *Aquatic fungi, Systematics.
Identifiers: Aphanomyces, *Iceland, Lagenocytis, Myzocytium.

A sample of stream water from Iceland revealed rotifer eggs infested with a eucarpic fungus producing biflagellate planonts. An unusual characteristic is the production olpidioid sporangia and ecentric oospores. Taxonomic discussion, considering the Leptiomitaceae, Legenocytis radicicola, Myzocytium spp., Ectrogellaceae and Aphanomyces sp., is included. A formal description is provided, but the organism is not named.--Copyright 1974, Biological Abstracts, Inc.
W75-00527

PALEOLIMNOLOGICAL STUDIES OF TESTACEAE FROM SEDIMENT CORES FROM LATNJAJAURE (ABISKO REGION; SWEDISH LAPPLAND) (IN GERMAN),
W. Schoenborn.
Hydrobiologia. Vol 42, No 1, p 63-75, 1973, Illus. English summary.

Descriptors: *Lake sediments, Eutrophication, Cores.
Identifiers: Abisko region, Centropyxis, Difflugia, Rhizopods, *Sweden(Lake Latnjajaure).

Rhizopod tests from 16 cores of sediments from Lake Latnjajaure, in Swedish Lappland, show the development of the lake since its formation. Latnjajaure is a oligotrophic mountain lake. All cores contained many remains of rhizopods, most of them intact. Most broken tests could be reconstructed. Postglacial development of a lake could thus be elucidated for the first time. The sediment cores contained 24 spp. of Testaces, 41.6% of the recent fauna. The rank order of species forming 1% or more of the total number in the cores is nearly identical with the rank order of recent species. The history of lake Latnjajaure is characterized by Centropyxis aerophila, an oligotrophic species. Periods of beginning eutrophication are indicated by a decrease of Centropyxis aerophila and an increase of Difflugia species, but typical eutrophic species were absent. A dystrophic phase in the development could not be ascertained by means of rhizopods.--Copyright 1974, Biological Abstracts, Inc.
W75-00533

PHYSICOCHEMICAL ASPECTS OF LAKE MCILWAINE (RHODESIA): A EUTROPHIC TROPICAL IMPOUNDMENT,
Department of National Parks and Wild Life Management, Causeway (Rhodesia).
B. E. Marshall, and A. C. Falconer.
Hydrobiologia. Vol 42, No 1, p 45-62, 1973, Illus.

Descriptors: *Oxygen, *Temperature, *Lake stages, *Eutrophication, Lakes, Water pollution effects.
Identifiers: *Rhodesia(Lake McIlwaine).

The normal O2 temperature patterns are described and the effect of flood water on these patterns is discussed. Several important chemical parameters are described and the effects of lake-level fluctuations and stratification are outlined. There is a brief discussion on the effects of eutrophication in tropical lakes and some indication is given of measures being taken to reduce nutrient input to Lake McIlwaine.--Copyright 1974, Biological Abstracts, Inc.
W75-00535

5D. Waste Treatment Processes

IMPROVING GRANULAR CARBON TREATMENT,
FMC Corp., Princeton, N.J.
L. D. Friedman, W. J. Weber, Jr., R. Bloom, Jr., and C. B. Hopkins.
Copy available from GPO Sup Doc as EP1.16:17020GPN07/H, $1.00; microfiche from NTIS, Springfield, Va 22161 as PB-227 588 $2.25. Environmental Protection Agency, Water Pollution Control Research Series, July 1971. 83 p, 18 fig, 23 tab, 11 ref. EPA Project 17020 GDN 07/71. No. 14-12-901.

Descriptors: *Waste water treatment, Adsorption, Aerobic conditions, *Activated carbon, Carbon, Coal, Aeration, Costs, Biochemical oxygen demand.
Identifiers: *Carbon treatment, *Clarification, Organic carbon, Carbon regeneration.

The magnitude and effects of biological activity in expanded carbon beds used for direct clarifica-

tion/adsorption treatment of wastewater were investigated. Primary sewage effluent was coagulated with FeCl3, clarified, filtered and charged to carbon columns. Clarification removed 60% of the total organic carbon (TOC) and 55% of the BOD. Carbon activity comparisons were made in identical series of four columns containing 24 ft of carbon. Aerobic conditions achieved by bleeding 6 to 10 mg/l O2 into the feed, enhanced activated carbon's activity and prolonged its effectiveness. In a nine-month pilot-scale study, overall TOC removal was 87.2%, BOD removal exceeded 90%, and effluent TOC or BOD averaged 8 to 9 mg/l. Aerobic activated carbon columns removed 14% more TOC than anaerobic, and over 20% more TOC than aerobic coal columns. Products from anaerobic columns contained H2S and clouded on standing; aerobic products did not. Estimated treatment costs for combined clarification/adsorption treatment at 10 mgd are 20 cents/1000 gal. with activated carbon and 18 cents/1000 gal. with coal, which yields a product with TOC or BOD of about 12 mg/l. (EPA)
W75-00005

APPLICATION OF PLASTIC MEDIA TRICKLING FILTERS FOR BIOLOGICAL NITRIFICATION SYSTEMS,
Dow Chemical Co., Midland, Mich.
G. A. Duddles, and S. E. Richardson.
Copy available from GPO Sup Doc as EP1.23/2:73-199, $1.25; microfiche from NTIS, Springfield, Va 22161 as PB-227 628, $2.25. Environmental Protection Agency, Technology Series Report EPA-R2-73-199, June 1973. 111p, 17 fig, 17 tab, 17 ref, append. Control No. 14-12-900. EPA Project 17-10 FSJ.

Descriptors: *Biological treatment, *Nitrification, *Denitrification, *Trickling filters, *Municipal water, Filtration, *Waste water treatment, *Michigan.
Identifiers: Temperature effects, Ammonia nitrogen, Nitrate nitrogen, Process efficiency, Frequency distribution, *Midland(Mich).

This study demonstrated the feasibility of using plastic media in a stage system to achieve biological nitrification of municipal effluents. The secondary effluent from the Midland, Michigan, wastewater treatment plant was dosed to a pilot scale trickling filter containing plastic media with a specific surface area of 27 sq ft/cu ft. This effluent contained 15-30 mg/l of BOD5 and 10-20 mg/l of ammonia nitrogen. When dosed to the filter at application rates of 0.5 gpm/ft2 consistent nitrification was obtained under both summer and winter conditions. Net cell growth was minimal, and the filter effluent could be directly filtered by tri-media filtration. The tri-media filter also served as a denitrification system when methanol was added to the nitrified effluent ahead of filtration. Significant changes were noted in the operational characteristics of the tri-media filter. (Barth-EPA)
W75-00008

CHEMICAL TREATMENT OF PLATING WASTE FOR REMOVAL OF HEAVY METALS,
Beaton and Corbin Mfg. Co., Southington, Conn.
J. J. Martin, Jr.
Copy available from GPO Sup Doc as EP1.23/2:73-044, $0.75; microfiche from NTIS, Springfield, Va. 22161 as PB-227-363, $2.25. Environmental Protection Agency, Technology Series Report EPA-R2-73-044, May 1973. 40 p, 10 fig, 4 tab, 4 ref, append. EPA Project 12010 DMF. WPRD 244-01-68.

Descriptors: *Waste water treatment, *Water reuse, Reclaimed water, *Industrial wastes, *Heavy metals, Sludge, Landfills, Ultimate disposal, Chromium, Nickel, Zinc, Copper.
Identifiers: *Plating waste treatment, Chemical rinsing, Chromium treatment, Cyanide treatment, Acid bright dip treatment, *Chemical treatment.

Chemical rinsing of electroplated parts and batch chemical treatment of spent processing solutions have been demonstrated to be a practical approach for abating pollution at a small captive metal finishing facility. The treatment system reduced the amount of chromium, nickel, zinc, copper and other heavy metals in the waste to a level where substantial quantities of water could be reused. The precipitation of toxic metals in the chemical rinsing system produced an easily settled dense sludge, which was further compacted in simple outdoor earthen sludge beds for ultimate disposal as landfill. (EPA)
W75-00010

DEVELOPMENT OF ON-SHORE TREATMENT SYSTEM FOR SEWAGE FROM WATERCRAFT RETENTION SYSTEM,
FMC Corp., San Jose, Calif. Advanced Products Div.
J. H. Robbins, and A. C. Green.
Available from the National Technical Information Service, Springfield, Va 22161 as PB-234 645, $2.25 in microfiche. Environmental Protection Agency, Cincinnati, Ohio, Technology Series Report EPA-670/2-74-056, July 1974. 113 p, 12 fig, 21 tab, 25 ref, 6 append. EPA 1BB038/ROAP 21-BBU/TASK 03. 68-32-0220.

Descriptors: *Waste water treatment, *Sewage treatment, *Zinc, Toxicity, Operating costs, *Activated sludge, Chlorination, Waste identification.
Identifiers: *Physical-chemical sewage treatment, Marine sewage treatment, Holding tanks, Chemical additives, *Watercraft sewage, Pump out wastes, Post chlorination, *Formaldehyde.

A two-phase program developed and demonstrated a new method for on-shore treatment of sewage from recreational watercraft. Phase I characterized wastes and chemical additives associated with recirculating/retention systems. Statistical analysis determined probable ranges of waste characteristics as a function of watercraft type and location. Typical wastes had suspended solids and biochemical oxygen demand of 2000 mg/l. Respirometer studies evaluated toxicity of additives to activated sludge. Treatability of chemical/sewage mixtures was determined from pilot-scale activated sludge plant operations. Cell yield coefficients were calculated. Photomicrographs recorded physical changes to activated sludge. Concentrations greater than 20 mg/l zinc or 120 mg/l formaldehyde caused adverse effects to the activated sludge process. Phase II field tested full-scale physical-chemical treatment equipment operating on watercraft wastes. Average removal efficiencies for suspended solids, biochemical and chemical oxygen demand, phosphate, and zinc were greater than 90 percent. Effluent coliform was less than 10 MPN/100 ml. Discharge solids were nonodorous and innocuous. Postchlorination increased total-nitrogen removal from 30 to 70 percent. Operating costs were determined. (EPA)
W75-00014

WASTE WATER TREATMENT AND REUSE IN A METAL FINISHING JOB SHOP.
Williams (S. K.) Co., Wauwatosa, Wis.
Available from the National Technical Information Service, Springfield, Va 22161 as PB-234 476, $2.25 in microfiche. Environmental Protection Agency, Cincinnati, Ohio, Technology Series, Report EPA-670/2-74-042, July 1974. 58 p, 11 fig, 16 tab, 9 ref. 1BB036/ROAP 21AZO/TASK 06 EPA Project 12010 DSA.

Descriptors: *Industrial wastes, Chromium, Nickel, Zinc, Copper, Cadmium, *Waste water treatment, Water treatment, Metals, *Heavy metals, *Water reuse.
Identifiers: *Metal finishing, Cyanides.

A complete waste water treatment system has been installed as part of a new S. K. Williams Company job plating facility, to make the effluent suitable for discharge. Most of the metal finishing processes common to the industry are included in the plant. Despite the wide range of toxic materials used in these processes, the new treatment system is providing an effluent essentially meeting the limitations on toxic ions given in the U.S. PHS drinking water standards. Five integrated waste treatment systems, each designed for a specific type of waste compound, are used to protect the rinse waters from contamination by process solution drag-out. A batch-type treatment system handles miscellaneous and intermittent discharges. The system design aims for a minimum volume of sludge production and a unique and economical sludge dewatering technique is included. Improved rinsing efficiency is achieved through the use of the integrated chemical rinses, thus permitting the plant to operate on a minimum water supply. Chemical reaction efficiency was considered in the design of each phase of the treatment system, to insure reduced chemical consumption and maximum economy of operation. Data are presented on the operating and capital costs for the entire system and operating experiences are described. (EPA)
W75-00015

WASTE INTO WEALTH,
Melbourne and Metropolitan Board of Works Farm (Australia).
S. S. Searle, and C. F. Kirby.
Water Spectrum, Vol 945, No 36, p 15-21, January, 1973. 2 fig.

Descriptors: *Municipal wastes, Farm wastes, Sewerage, *Sewage treatment, Costs, Industrial wastes, Irrigation, Soils, *Australia, Cattle, *Land management, *Waste water treatment, Waste disposal.
Identifiers: *Melbourne(Aus).

About twenty-two miles outside of the city of Melbourne, Australia, a combination beef cattle ranch and sewage treatment facility functions. The ranch, called the Board of Works Farm, is systematically irrigated by waste waters of the highly industrialized city. Suspended material is filtered by the soil and transformed into humus and plant food by the action of soil micro-organisms. The total flow includes domestic wastes, industrial wastes, and groundwater infiltration into the sewers. Industrial waste water provides about half the biochemical oxygen demand and suspended solids. Channels, drains, and ditches were carefully constructed and are inspected daily by laboratory analyses. The efficient disposal by soil filtration depends on the grasses being kept short; sheep and cattle both have the role of grass mowers. The farm remains highly productive, economically sound, as well as an efficient waste water treatment project. (Prague-FIRL)
W75-00106

DESIGN AND OPERATIONAL MODEL FOR COMPLETE MIXING ACTIVATED SLUDGE SYSTEM,
Kansas Univ., Lawrence.
R. E. McKinney.
Biotechnology and Bioengineering, Vol 16, No 6, p 703-722, June, 1974. 14 ref.

Descriptors: *Activated sludge, *Domestic wastes, *Industrial wastes, *Mathematical models, Pilot plants, Field studies, *Design criteria, Microbiology, Treatment facilities, *Waste water treatment, *Mixing, *Operations.
Identifiers: Complete mixing activated sludge(CMAS), Treatment methods.

The complete mixing activated sludge (CMAS) system is gaining in popularity for treating both domestic and industrial waste waters. A simple mathematical model was produced which can be

used in both the design and the operational evaluation of CMAS systems. Laboratory pilot plants and full scale field units have furnished basic data to confirm the validity of the mathematical model. Concepts of the model are discussed in light of field evaluations as are areas of conflict and confusion which had arisen in the past. Design examples and operational evaluations are presented for several different waste water systems. (Prague-FIRL)
W75-00112

DESIGN OF BASIN COLLECTION TROUGHS,
Envirex, Inc., Waukesha, Wis.
For primary bibliographic entry see Field 8A.
W75-00125

WATER TREATMENT PLANT DESIGN IS FLEXIBLE,
For primary bibliographic entry see Field 5F.
W75-00126

FOAM SEPARATION OF LEAD(II) AND CADMIUM(II) FROM WASTE WATER,
Vanderbilt Univ., Nashville, Tenn. Dept. of Chemistry.
B. B. Ferguson, C. Hinkle, and D. J. Wilson.
Separation Science, Vol 9, No 2, p 125-145, 1974. 18 fig, 2 tab, 21 ref.

Descriptors: *Foam separation, *Feasibility studies, Evaluation, *Waste water treatment, *Lead, *Cadmium, *Separation techniques.
Identifiers: Ion flotation.

Feasibility studies were conducted to evaluate the efficiencies of lead(II) and cadmium(II) removal from contaminated waste water using foam separation techniques. Variables such as pH, ionic strength, collector concentration, and interfering ions were studied to determine their effects on ion flotation. Adsorbing colloid flotation gave excellent results; lead sulfide and cadmium sulfide were adsorbed to ferrous sulfide which was then removed by foaming with hexadecyltrimethylammonium bromide. Lead(II) levels were reduced from 0.80 to 0.025 ppm in 34 minutes foaming with 15 ppm iron (III) added. Cadmium(II) levels were reduced from 1.0 to 0.008 ppm in 45 minutes foaming with 25 ppm iron(III) added. (Sandoski-FIRL)
W75-00127

WASTE WATER RENOVATION THROUGH SOIL PERCOLATION,
Department of Agriculture, Agassiz(British Columbia). Research Station.
M. K. John.
Water, Air, and Soil Production, Vol 3, No 1, p 3-10, March, 1974. 3 tab, 12 ref.

Descriptors: Laboratory tests, *Simulation analysis, *Waste water treatment, *Percolation, Soil physical properties, Sewage treatment, Phosphorus, *Leaching, Water pollution control, *Water reuse.
Identifiers: *Phosphorus removal.

A laboratory experiment simulating high-rate effluent renovation by soil percolation involved leaching secondary sewage effluent through columns of three differing soils. Analyses of phosphorus in 22 leachate collections and distribution of both organic and inorganic phosphorus in column sections revealed the mechanisms of phosphorus removal, the influence of differing soil properties, and the effect of continuous utilization. The leachate NO3-N levels were lower than the original NO3-N content of effluent for the first ten leachings but NO3-N enrichment occurred for the last effluent percolations through all three soils. (Sandoski-FIRL)
W75-00128

PRODUCTS AND PROCESSES FOR THE TREATMENT AND CONDITIONING OF WATER (PRODUITS ET PROCEDES DE TRAITEMENT ET DE CONDITIONNEMENT DES EAUX).
La Technique Moderne, Vol 66, No 4, p 38-40, April, 1974.

Descriptors: *Potable water, *Industrial water, *Water purification, Chemicals, Separation techniques, *Waste water treatment, *Coagulation, Filtration, Adsorption, Corrosion control, *Flocculation.

Chemicals and processes for the preparation of drinking water and industrial waters, and for the purification of municipal and industrial waste water are described. Following mechanical separation of bulky materials, water is further purified by coagulation and flocculation by means of ferric chloride, and aluminum sulfate for the preparation of drinking and industrial water. Drinking water is further purified by filtration and adsorption by means of activated silica or carbon, and sterilization by means of chlorine dioxide. Algal proliferation can be prevented by the addition of polyamides, quaternary ammonium salts, and chlorine dioxide in industrial waters. To prevent encrustation and corrosion in pipelines, precipitation-retarding agents, such as polyphosphates, dispersing agents, and film-forming metasilicates are added. Cyanides are neutralized by means of sodium hypochlorite, and chromates are oxidized by sodium metabisulfite and ferrous sulfate. Dilute effluents can be concentrated by ion exchange resins, electrolysis, evaporation, or reverse osmosis.
W75-00129

MEASURING ELECTRODE POTENTIALS IN ANAEROBIC DIGESTION WITH STAINLESS STEEL ELECTRODES,
F. C. Blanc, and A. H. Molof.
Water and Sewage Works, Vol 121, No 5, p 64-66, 74, May, 1974. 5 fig, 13 ref.

Descriptors: *Stainless steel, *Electrodes, Anaerobic conditions, Fermentation, *Anaerobic digestion, Waste water treatment.
Identifiers: Electrode potential.

The successful use of stainless steel as a replacement for such metals as gold and platinum as an inert electrode under anaerobic conditions is examined. Experimental results show that stainless steel electrodes exhibited the same electrode potential readings and behavior as the commonly used, more expensive platinum electrodes in both acetate-fed methane fermentation units and in the sewage sludge-fed anaerobic digestion unit. This identical behavior of both metals was also observed during periods in which the electrode potentials varied considerably and during the initial electrode adjustment periods after first immersion of the electrodes. (Sandoski-FIRL)
W75-00131

PERCOLATION TESTS IN STRATIFIED SOIL,
For primary bibliographic entry see Field 5B.
W75-00132

MAGNETIC FLOWMETER THAT KEEPS ITS NOSE CLEAN,
For primary bibliographic entry see Field 7B.
W75-00133

OIL/WATER SEPARATOR FILTER.
French Patent 2196-187. Issued April 19, 1974. Derwent French Patents Abstracts, Vol 5, No 20, 1974.

Descriptors: *Patents, *Filters, *Separation techniques, Textiles, Fibers, Resins, Waste water treatment.
Identifiers: *Oil/water separator filter, Oil-water separation, Mineral wool, Glass fibers.

A patent was granted for an oil/water separator filter. The filter element consists of a fibrous core in an outer sheath. The core is made of fibers coated with a synthetic resin having a higher affinity for oil than for water. The fibers in an upper section are of textile material laid up in thin layers with the fibers side by side and transverse to flow direction. The resin coating acts as binder within the layers, loosely piled one on the other. A lower section significantly thicker than the above layers, consists of randomly oriented glass fiber or mineral wool. (Prague-FIRL)
W75-00143

WASTEWATER CONCENTRATION,
Sweco, Inc., Los Angeles, Calif. (assignee).
W. J. Talley, and H. W. Wright.
Canadian Patent 948,119. Issued May 28, 1974. Patent Office Record, Vol 102, No 22, p 47-48, May, 1974.

Descriptors: *Patents, *Combined sewers, *Waste water treatment, *Overflow, Screens, Flow rate, Effluents, Outlets, Influent streams, Cleaning, Centrifugation.

A patent was issued for equipment and methods for screening and concentrating waste water overflow from combined sewer systems. The equipment includes a separator employing a cylindrical rotating screen. Influent is piped upwardly into the equipment and deflected outwardly toward the inner surface of the screen. This manner achieves a desired flow rate and flow pattern of the influent onto the screen. The screen is rotated at a speed to achieve a desired centrifugal force. Effluent passes through the screen to an outlet and the remaining concentrate passes to an outlet. A certain amount of the influent splashes from the inner surface of the screen. This is received by a backsplash pan and may be recirculated and rescreened. The screen has several removable screen panels for replacing damaged screens or changing screen type or mesh size. Cleaning is provided by directing a cleaning fluid periodically at the screen. The manner in which the influent, effluent, concentrate and backsplash are handled, and manner in which the influent is screened for ultimate disposal, is detailed. A sequence of influent feed and screen cleaning is also described. (Prague-FIRL)
W75-00144

LIQUID PURIFICATION ION-EXCHANGE EQUIPMENT.
German Patent 1767-705. Issued April 25, 1974. Derwent German Patents Abstracts, Vol 5, No 18, p 1, June 7, 1974.

Descriptors: *Ion exchange, *Patents, *Equipment, Flow, Water purification, Waste water treatment.
Identifiers: Manifold chamber, Perforated walls, Active resin granules.

Equipment was patented which includes concentric perforated walls which enclose annular space and contain active resin granules. A first manifold chamber is enclosed centrally by the inner preforated wall. A second, annular manifold chamber is between the outside perforated wall and the cylindrical casing. The flow of water/liquid being treated is radial either inwards or outwards. The outer perforated wall extends for most of the height of the casing. The apparatus performs liquid purification, using ion exchange. (Prague-FIRL)
W75-00145

STUDY OF THE WATER PURIFICATION BY MEANS OF ELECTROLYZER WITH ALUMINUM ANODE (ISSLEDOVANIYE PROTSES-

SA OCHISTKI VODY V ELEKTROLIZERE S ALYUMINIYEVYM ANODOM),
For primary bibliographic entry see Field 5F.
W75-00147

STABILIZATION OF HIGHLY CONCENTRATED ORGANIC WASTE WATERS AND SEWAGE SLUDGES BY AEROBIC-THERMOPHILIC DECOMPOSITION PROCESSES (STABILISIERUNG HOCHKONZENTRIERTER ORGANISCHER ABWAESSER UND ABWASSERSCHLAEMME DURCH AEROB-THERMOPHILE ABBAUPROZESSE),
U. Loll.
Gas-Wasser-Fach - Wasser/Abwasser, Vol 115, No 4, p 191-198, April, 1974. 10 fig, 4 tab, 15 ref.

Descriptors: *Thermophilic bacteria, *Sewage sludge, *Aerobic treatment, *Microorganisms, Temperature, Stabilization, Biochemical oxygen demand, Chemical oxygen demand, Waste water treatment, *Hydrogen ion concentration.
Identifiers: *Aerobic-thermophilic decomposition.

The stabilization of highly concentrated organic waste waters and sewage sludges with BOD5 values ranging from 8,000 to over 100,000 mg/liter by aerobic-thermophilic decomposition was studied. Exothermal stabilization of highly concentrated organic waste waters and sludges was found possible by aerobic-thermophilic treatment for which the necessary energy is supplied by the aerobic microorganisms participating in the metabolic processes. The process temperature is spontaneously stabilized over 45C. The quantity of heat released amounts to 3.5 kcal per one g COD. Of the identified microorganisms participating in the stabilization process, Bacillus stearothermophilus, Bacillus coagulants and related bacilli are dominant. The magnitude of the rise in temperature above the initial substrate temperature increases with increasing initial BOD5 value and with increasing rates of decomposition. The pH value tends to end values of 8.7-9.5 by the end of the stabilization process that requires 2.5-7 days. (Takacs-FIRL)
W75-00148

SECURITY MEASURES AGAINST PRESSURE SURGE FOR THE CLEANED WATER OUTLET RUHLEBEN-TELTOWCANAL OF THE BERLIN SEWAGE PURIFICATION PLANT (DRUCKSTOSSSICHERUNGSMASSNAHMEN FUER DIE KLARWASSER-ABFLUSSLEITUNG RUHLEBEN-TELTOWKANAL DER BERLINER ENTWAESSERUNGSWERKE),
P. Franke.
Wasserwirtschaft, Vol 64, No 6, p 174-181, 1974. 8 fig, 3 ref.

Descriptors: *Sewage treatment, *Water purification, *Pressure, *Surges, Surge tank, Pump, Outlet works, Discharge, Atmospheric pressure, *Waste water treatment.
Identifiers: *Purification plants, Treatment methods.

The outlet system and the water hammer of the 15 km long cleaned water outlet Ruhleben-Teltowkanal of the Berlin sewage purification plant was investigated under transient conditions to determine adequate security measures against pressure surge. The security measures should be designed for the outflow of all pumps in the discharge line. As security measures against water hammer, either an increase of the mass of the rotating system, an air chamber, or a surge tank are possible. Each of these measures was computed and compared. Because of specific local conditions, a surge tank installed at the outlet system of the sewage purification plant was chosen as the best solution. Trial runs have shown that the surge tank prevents the water pressure from exceeding the rated pressure of the dicharge line and from falling below the atmospheric pressure. (Takacs-FIRL)
W75-00149

EXPERIENCES WITH TWO LAYERS OF ION EXCHANGERS IN FULL DESALINATION PLANTS (ERFAHRUNGEN MIT SCHLICHTBETTAUSTAUSCHERN IN VOLLENTSALZUNGSANLAGEN),
R. E. Brunner, and W. Hoffmann.
VGB Kraftwerkstechnik, Vol 54, No 4, p 235-242, 1974. 10 fig, 6 tab, 7 ref.

Descriptors: *Ion exchange, *Anion exchange, *Desalination, Carbonates, Acidity.
Identifiers: Counterflow, Hydrochloric acid, Chlorine ions, Elution.

Experiences with the use and regeneration of two-layer ion exchangers in full desalination are presented. Two-layer anion exchangers, composed of strong and weak acidic exchangers, especially suitable for the separation of sodium ions, are regenerated in counterflow. These use 0.7-1 percent sulfuric acid for the weak acidic exchanger, and 1.5-5 percent sulfuric acid for the strong acidic exchanger. If regeneration is done with hydrochloric acid, its concentration should not exceed 5 percent. The use of hydrochloric acid-regenerated counterflow two-layer ion exchangers is the most economical solution for waters with high carbonate hardness. Counterflow-regenerated anion exchangers, composed of a strong basic and another weak basic exchanger, are an ideal solution for full desalination. However, the elution of chlorine ions from the strong basic exchanger is problematic. (Takacs-FIRL)
W75-00150

THE PROBLEMS OF THE DISCHARGE AND OF THE TREATMENT OF THE WASTE WATERS OF THE PARIS URBAN AGGLOMERATION (LES PROBLEMES D'EVACUATION ET DE TRAITEMENT DES EAUX USEES DE L'AGGLOMERATION PARISIENNE),
J. Olivesi.
Industrie Minerale, Vol 56, No 3, p 118-123, March, 1974. 5 fig.

Descriptors: *Waste disposal, *Treatment facilities, *Urban areas, Pre-treatment, Biological treatment, Sewage sludge, Aeration, Activated sludge, Vacuum drying, Landfills, *Waste water treatment.
Identifiers: *Paris(France), Treatment plants, Thermal conditioning.

The waste water treatment and disposal method adopted at the Acheres waste water treatment facility servicing the Paris urban agglomeration is outlined. The waste waters received at the treatment plant are first pretreated for the mechanical removal of sand and voluminous objects, after which the supernatant is eliminated by decantation. The waste water thus pretreated is then subjected to two-stage biological treatment using aeration and activated sludge. The purified effluent is discharged into the recipient. The sewage sludge is digested, then conditioned thermally by exposing it to steam at 200 C for 15 minutes, and after dehydration in vacuum press, it is disposed of on a sanitary landfill. (Takacs-FIRL)
W75-00151

EVALUATION OF THE EXPERIENCES GAINED DURING THE OPERATION OF THE AEROBIC SEWAGE SLUDGE TREATMENT PLANT IN NYIREGYHAZA (A NYIREGYHAZI AEROB ISZAPKEZELO BERENDEZESSEL SZERZETT UZEMI TAPASZTALATOK ERTEKELESE),
J. Olah.
Hidrologiai Kozlony, Vol 54, No 1, p 41-48, January, 1974. 5 fig, 3 tab, 10 ref.

Descriptors: *Aerobic treatment, *Organic matter, *Sewage sludge, *Stabilization, Activated sludge, Waste water treatment, Dehydration.
Identifiers: Stabilizing plant.

Experiences gained with a partly oxidizing aerobic sewage sludge stabilizing plant are evaluated. Comparative experiments and economic considerations concerning the anaerobic and aerobic stabilization of excess sludge and raw sludge mixtures revealed the superiority of aerobic treatment. The excess activated sludge or the mixture of the raw and activated sludge was treated in a 700 cu m earth basin by means of an Abtaerator aerator of 2.4 m in diameter in semicontinuous operation, using purified waste eater as wash liquid. The aerator organic matter load was maintained at 1.54-1.95 kg/cu m/day at an excess activated sludge concentration of 15 kg/cu m and at a hydraulic hold time of 6.8 days, and a reduction by 17-20 percent in the organic matter content was achieved. The treated sludge could be easily dehydrated in drying beds without decomposing of odors. During the treatment of the excess sludge, foam and suspension formation was observed after 3 weeks operation that could be controlled by increasing the wash liquid expenditure. To maintain the aerator temperature above 10C in the winter period, it is necessary to increase the wash liquid expenditure by 10 times. (Takacs-FIRL)
W75-00152

TREATMENT AND DIGESTION OF SEWAGE SLUDGE PRODUCED BY WASTEWATER TREATMENT PLANTS (TRATTAMENTO E SMALTIMENTO DEI FANGHI PRODOTTI DAGLI IMPIANTI DI DEPURAZIONE DELLE ACQUE DI SCARICO),
T. Songa, and A. Aveni.
Ingegneria, No 2, p 81-93, February, 1974. 7 fig, 7 tab, 11 ref.

Descriptors: *Sewage sludge, *Sludge disposal, *Anaerobic digestion, *Aerobic digestion, Chlorination, Dehydration, Incineration, *Waste water treatment.
Identifiers: Mesophilic digestion, Agricultural uses, Sludge conditioning, Treatment methods.

The complex system of the treatment and disposal of sewage sludge produced by waste water treatment plants is surveyed. The sewage sludge, a mixture of different sludges generated by the different waste water treatment processes steps, is either sterilized by pasteurization or chlorination, or conditioned thermally or chemically for the conversion of colloids to settling floccules by aggregation, or digested anaerobically or aerobically. Anaerobic digestion at a constant temperature for 20 to 30 days, and especially between 16 and 38C (mesophilic digestion) is the most commonly used digestion process, as compared with aerobic digestion. Conditioned sludge is subjected to dehydration on drying beds, by centrifugation, vacuum filters, or filter presses, while anaerobically digested sludge is dried on drying beds, in rotary furnaces, in fluidized beds, and in the form of atomized suspension. After drying and dehydration, the sludge can be incinerated in multistage or rotary furnaces, in fluidized-bed furnaces, and atomization furnaces, or stabilized by composting or the Zimpro process. Following such treatment, the ashes and sludge can be disposed of safely, and the compost obtained, possibly mixed with peat, can be used for agricultural purposes. (Takacs-FIRL)
W75-00153

NEW HIGH-EFFICIENCY METHODS FOR THE DESALTING OF NATURAL WATERS AND FOR THE PURIFICATION OF WASTEWATERS (NOVYYE VYSOKOEFFEKTIVNYYE METODY OPRESNENIYA PRIRODNYKH I OCHISTKI STOCHNYKH VOD),
A. A. Yasimov, and D. L. Mayzlik.
Khimicheskaya Promyshlennost', No 3, p 182-189, 1974. 7 fig, 3 tab, 52 ref.

Descriptors: *Reverse osmosis, *Waste water treatment, *Pulp wastes, *Semipermeable membranes, *Desalination, Water purification, Separa-

tion, Industrial wastes, Proteins, Microorganisms, Enzymes, *Filtration.
Identifiers: *Ultrafiltration.

The uses and advantages of reverse osmosis and ultrafiltration by means of semipermeable membranes, especially those made of acetylcellulose membranes, in seawater desalination and in the purification of industrial effluents are surveyed. These methods often are less expensive than conventional treatment methods. Modern multistage reverse osmosis units are suitable for the effective and inexpensive desalination of seawater even with high salt contents. Reverse osmosis and ultrafiltration are suitable for the purification of effluents in the pulp and paper industry, electroplating industry, and for the removal of pathogenic germs, viruses, microorganisms, surfactants and enzymes from water. Ultrafiltration is suitable for the concentration and removal of substances with high molecular weight, but also of low-molecular substances such as urea, phenol, acetone from protein, nucleic acid and polypeptide solutions, and for the separation of aqueous solutions of glucose, lactose, maltose, ethyleneglycol, and propyleneglycol. (Takacs-FIRL)
W75-00154

TERTIARY TREATMENT OF SEWAGE TREATMENT PLANTS (IN JAPANESE),
Tokyo Sewerage Bureau (Japan).
S. Kato, and Y. Araki.
Mitsubishi Denki Giho, Vol 48, No 4, p 444-451, April, 1974. 6 fig, 1 tab, English summary.

Descriptors: *Tertiary treatment, *Water quality control, Treatment facilities, Filtration, Activated sludge, Sand.
Identifiers: Morigasaki Treatment Plant(Japan), High speed sand filtration.

Tertiary treatment is seen as a new treatment method from the perspective of prevention of water pollution and effective utilization of water resources. There are several types of tertiary treatment under development, depending on the objects of removal and the removing rate. In Morigasaki Treatment Plant, a tertiary treatment plant has been constructed for treated water by high speed sand filtering method on secondary treated water from the activated sludge method. This plant intends to supply water for miscellaneous purposes, such as pumps sealing water, and to gather data of a tertiary treatment plant. Installations and ongoing experiments are described. (Prague-FIRL)
W75-00155

DEVELOPMENT OF A SIMPLE AND INEXPENSIVE METHOD FOR THE DETERMINATION OF ORGANICALLY BOUND CHLORINE ON ACTIVATED CARBON IN WATERWORKS FILTERS (ENTWICKLUNG EINER EINFACHEN UND BILLIGEN METHODE ZUR BESTIMMUNG VON ORGANISCH GEBUNDENEN CHLOR AUF AKTIVKOHLE VON WASSERWERKSFILTERN),
For primary bibliographic entry see Field 5A.
W75-00156

GEL- AND ULTRAMEMBRANE FILTRATION OF AQUATIC HUMUS: A COMPARISON OF THE TWO METHODS,
Institut for Vannforskning, Blindern.
For primary bibliographic entry see Field 5A.
W75-00162

SANITARY DRAINAGE SYSTEM,
Carlson (Andrew) and Sons, Inc., Kings Park, N.Y. (assignee).
H. B. Carlson, and J. R. Pinezich.
United States Patent 3,817,864. Issued June 18, 1974. Official Gazette of the United States Patent Office, Vol 923, No 3, p 1068, June 18, 1974. 1 fig.

Descriptors: *Patents, *Septic tanks, *Sanitation, *Drainage, Materials, Precast concrete construction, *Waste water treatment.
Identifiers: *Sanitary drainage system, *Fiberglas.

A novel and improved sanitary drainage system was patented. The septic tank of the system is fabricated from Fiberglas which has advantages over the use of pre-cast concrete or other material previously used. It is non-corrosive, impervious, and light and strong with some flexibility. The Fiberglas septic tank has a generally hemi-spherical, furstoconical or polygonal shape. (Prague-FIRL)
W75-00169

WASTE TREATMENT SYSTEM,
General Electric Co., New York. (assignee).
F. J. Milotich.
United States Patent 3,819,053. Issued June 25, 1974. Official Gazette of the United States Patent Office, Vol 923, No 4, p 1378, June 25, 1974. 1 fig.

Descriptors: *Patents, *Waste water treatment, *Coagulation, *Sewage treatment, Tanks, Screens.
Identifiers: *Sludge blanket.

The bottom of a solids separating tank treats sewage which has been ground, macerated, and treated with a coagulant. Solids accumulate in a sludge blanket below a screen which divides the tank into upper and lower portions. Clear liquid passes through the blanket and screen. Sludge from the sludge blanket is pumped to a sludge concentrating tank where further liquid is extracted. The concentrated sludge is periodically pumped out for incineration or other disposal. (Prague-FIRL)
W75-00170

SEWER RELIEF VALVE,
For primary bibliographic entry see Field 8C.
W75-00172

SINGLE BASIN AERATED SEWAGE LAGOON WITH SPRING TIME INTENSIFIED AERATION,
Atara Corp., Montreal (Canada). (assignee).
D. S. Murphy.
Canadian Patent 948,334. Issued May 28, 1974. Patent Office Record, Vol 102, No 22, p 93-94, May 28, 1974.

Descriptors: *Patents, *Sewage lagoons, *Aerated lagoons, *Aeration, Seasonal, Sewage treatment, Streams, Basins, *Waste water treatment.

An aerated sewage lagoon provides a much increased aeration in the spring, reduced aeration in the summer, and still further reduction in the winter. In winter there is an area of high intensity aeration near the sewage intake, and little or none elsewhere. In spring there is a second high intensity area to cope with the suddenly increased demand due to winter dormancy. In summer the high intensity aeration is followed by an area over which the aeration continues but at gradually reduced intensity as the sewage moves downstream to the outflow. (Prague-FIRL)
W75-00173

PROCESS FOR TREATMENT OF WASTE LIQUIDS CONTAINING DIFFICULTLY DECOMPOSABLE CYANO-COMPLEX,
Mitsui Mining and Smelting Co. Ltd., Tokyo (Japan). (assignee).
M. Ichiki, and M. Ishii.
United States Patent 3,816,275. Issued June 11, 1974. Official Gazette of the United States Patent Office, Vol 923, No 2, p 673, June 1974.

Descriptors: *Patents, *Colloids, *Scum, Iron, Floating, *Waste water treatment.
Identifiers: *Cyano-complexes, Waste liquor, Anodes, Electrolytic cells.

A process for treating a waste liquor containing a difficulty decomposable cyano-complex such as ferrocyanides and ferrieyanides and/or cyano ions is described. It comprises electrolyzing the waste liquor by employing iron as an anode to form a water-insoluble colloid. The colloid is floated and concentrated by an action of bubbles formed during the electrolysis. The material is converted to a scum, and the scum is removed from the waste liquor in an electrolytic cell. A purified liquor free of cyano-component is obtained. (Prague-FIRL)
W75-00174

CLARIFICATION OF TAR SANDS MIDDLINGS WATER,
Gulf Oil Canada Ltd., Toronto (Ontario), And Atlantic Richfield Canada Ltd., Calgany (Alberta). (assignee)
R. Schutte.
United States Patent 3,816,305. Issued June 11, 1974. Official Gazette of the United States Patent Office, Vol. 923, No 2, p 678, June, 1974.

Descriptors: *Flocculation, *Coagulation, *Clays, *Waste water treatment, Settling ponds.
Identifiers: *Tar sands, Middlings, Tailing streams, *Clarification.

A patent was issued for a process which involves the addition of an acid to water to accelerate clarification of the water and to reduce required sludge settling pond area. This process is useful for treating tar sands to cause flocculation or coagulation of the clays and other small solids particles produced from the hot water process and present in middlings and tailings streams. (Prague-FIRL)
W75-00177

LIFTING THE LID OFF PITSEA,.
Surveyor Public Authority Technology, No 4275, p 13, May 17, 1974.

Descriptors: *Landfills, *Lagoons, Waste storage, Trenches, Waste treatment, Treatment facilities, Liquid wastes, Evaporation, Separation techniques, Oil wastes, Waste disposal.
Identifiers: *United Kingdom(Pitsea-Eng).

The lagooning area at the Pitsea, England landfill site consists of a series of long, narrow interlinked trenches dug in surveyed positions in fully composted refuse. The trenches have a shallow weir constructed where they join and the waste is introduced from the pipeline at one end of the system. It then flows along the first trench over the weir and then along the rest of the system. Phase separation of the oily wastes using acids to aid the separation is a feasible proposition on a large scale showing that mixing and dilution of suitable wastes resulted in pumpable sludge, acceptable for site disposal. Finally, it is noted that the most efficient way of disposing of liquid wastes at Pitsea is to utilize the high potential evaporation from the site rather than rely on groundwater flow away from it. (Sandoski-FIRL)
W75-00180

STREET DRAIN FOR USE WITH A SEWER SYSTEM,
L. B. Thompson.
United States Patent 3,815,749. Issued June 11, 1974. Official Gazette of the United States Patent Office, Vol 923, No 2, p 549, June, 1974. 1 fig.

Descriptors: *Patents, *Drains, *Sewers, Roads, *Drainage systems, Storm water, *Sewerage, Waste water treatment.
Identifiers: Collection basins, Dry wells.

A street drain is used with a sewer system and includes a water collection basin, positioned in the

street, and a dry well generally located adjacent to the street. The collection basin has two discharge openings. One of the openings is placed in communication with the dry well, the other is placed in communication with the sewer system. The basin discharge opening which is connected into the sewer system is located so that water, such as storm water, entering the collection basin will first pass into the dry well until the dry well is filled and then will pass into the sewer system. (Sandoski-FIRL)
W75-00182

I C E VISITS EDINBURGH'S (POUNDS) 22M TUNNELLED SEWER SYSTEM,
S. Wade.
New Civil Engineer, No 92, p 24, May 16, 1974.

Descriptors: *Sewers, *Tunneling, Construction materials, Tunnel linings, Treatment facilities, *Sewerage, *Waste water treatment.
Identifiers: *United Kingdom(Seafield Bay).

An interceptor sewer system which will intercept the flow from Edinburgh and direct it for primary treatment on reclaimed land in the Seafield Bay area will be 18 km long when completed in 1976. The greater part of the system is being tunnelled with a primary lining of standard segments and a secondary lining formed with in situ concrete. The treatment works will provide primary treatment although space has been allowed in the total area of reclamation for extension to further treatment should it ever be required in the future. (Sandoski-FIRL)
W75-00183

PROCESS FOR THE REMOVAL OF SOLID PARTICLES FROM AN AQUEOUS SUSPENSION THEREOF AND APPARATUS THEREFOR,
Shell Internationale Research Maatschappij N.V., The Hague (Netherlands).
P. Visser, and L. W. Haar.
Canadian Patent 948,518. Issued June 4, 1974. Patent Office Record, Vol 102, No 23, p 37, June, 1974.

Descriptors: *Patents, *Separation techniques, Solid wastes, Waste water treatment, Methodology, Equipment.

A process removes solid particles by adding a water-immiscible, auxiliary liquid to the suspension and separating a resulting mixture of solid particles and auxiliary liquid from a water phase. The auxiliary liquid is supplied in two stages by adding: a minor part of the water-immiscible auxiliary liquid to the aqueous suspension in a mixing stage and imparting a turbulent motion to form agglomerates of solid particles and auxiliary liquid in water; and a major part of the auxiliary liquid to the mixture of agglomerates in water in a separating stage, in which stage a bottom layer of water and a top layer of auxiliary liquid comprising the agglomerates are formed. (Sandoski-FIRL)
W75-00185

DOMESTIC SEWAGE TREATMENT PLANT,
Sanitary Disposal Systems, Inc., Wheat Ridge, Colo.
J. S. Stone.
Canadian Patent 948,798. Issued June 4, 1974. Patent Office Record, Vol 102, No 23, p 97, June, 1974.

Descriptors: *Patents, *Sewage treatment, *Treatment facilities, Equipment, *Domestic wastes, Waste water treatment.

The plant comprises a cylindrical tank having an inner truncated conical baffle in the tank, spaced from the top, bottom, and side walls of the tank. The top lip of the baffle is positioned below the normal liquid level within the tank. An outer truncated conical baffle is positioned concentrically outside the inner baffle. The bottom end of the outer baffle is coextensive with that of the inner baffle, but the top end extends above the tank's normal liquid level. The two baffles form an annular upflow passage between them. Air inlets are provided to admit air into the bottom end of the upflow passage. A sewage inlet admits sewage into the top end of the inner baffle. The introduction of air into the upflow passage causes the upward movement of air and liquid in the manner of an air-lift pump. The pump discharges back into the inner baffle with a downward thrust. The continuous circulation of solids in this manner results in a reduction of their size, so that they are prepared for further treatment. (Sandoski-FIRL)
W75-00187

KEEPING WATCH ON WASTEWATER,
Camp, Dresser and McKee, Boston, Mass.
M. E. Rogers.
Water and Wastes Engineering, Vol 11, No 6, p 38-40, June, 1974. 2 fig.

Descriptors: *Computers, *Instrumentation, *Waste water treatment, New York, Data storage and retrieval, *Treatment facilities, Design criteria.
Identifiers: *New York City(NY).

Lower first cost and the integrating of data handling and modern process control into the existing operating staff are two of the advantages of a new computer installation at one New York City waste water plant. The modern instrument and computer-based data handling system is being provided in connection with the upgrading and enlarging of the Tallman Island pollution control plant serving the Borough of Queens area. The plant was designed to use a computer-based data handling system with advanced design, solid-state electronic instrument systems. Only the minimum number of recording instruments and several spare recorders are used. In this way, any of the process variables or derived values can be assigned for trending. (Sandoski-FIRL)
W75-00189

THE MINI-SIZE TREATMENT PLANT.
Excavating Contractor, Vol 68, No 6, p 25, June, 1974.

Descriptors: *Treatment facilities, *Construction materials, Steel, *Concrete, *Sewage treatment, *Waste water treatment, *New Jersey.

Practical sewage treatment systems are now available for small community waste treatment application. A privately owned sewage plant installed new Lakewood, New Jersey is described. The question of concrete or steel construction materials is debated mentioning problems such as corrosion, space, and maintenance. Both precast and poured methods for concrete construction are discussed. (Sandoski-FIRL)
W75-00190

SONICS PLUS OZONE A WINNER,
C. W. Heckroth.
Water and Wastes Engineering, Vol 11, No 6, p 41-44, June, 1974.

Descriptors: *Waste water treatment, *Sewage treatment, *Ozone, *Tertiary treatment, Effluent stream, Equipment, Treatment facilities, Sludge treatment, *Florida.
Identifiers: *Ozonation, *Ultrasonic bombardment, Indiantown(Fla).

Sonics has been combined with ozonation in a quick-step tertiary treatment at Indiantown, Florida to yield a fully-acceptable effluent. The complete system, using chemical/mechanical, filtration, and sonics/ozone steps, inactivates pathogenic viruses and kills bacteria detrimental to public health within two hours. The Sonozone system encompasses a primary stage of settling and contact with coagulants, followed by a filtration system to remove microsized solids and organics, and finally the tertiary step that takes the waste stream through ultrasonic bombardment and ozonation. All equipment is back-flushed using effluent and the back-flush water is recycled through the plant. Residual ozone and dissolved oxygen appear in the treated effluent. The sludge is sent to sand beds and the excess sludge liquid is recycled to the plant. The dried sludge is collected and periodically transported to a sludge disposal area. (Sandoski-FIRL)
W75-00191

HOUSTON SUBURBS PROFITS FROM BUILDING THE STATE'S BEST WASTE WATER TREATMENT PLANT.
Water and Sewage Works, p 38-40, April 30, 1974.

Descriptors: *Treatment facilities, *Texas, *Sewage treatment, *Tertiary treatment, Equipment, *Filtration, *Activated sludge, Biological treatment, Instrumentation, Economics, Operating costs, *Waste water treatment.

The unincorporated area, Montgomery County Fresh Water Supply District No. 2, produces a clean effluent by one of Texas' first three-stage sewage treatment plants. The district installed a big, advanced plant then sold excess capacity to neighboring districts. Within two months of starting plant operation, (in September 1971) the district had found buyers for 700,000 of the plant's one mgd capacity. The plant is a factory-built field-erected system whose major components were built by Ecodyne Corporation's Smith and Loveless division. The secondary stage of the treatment system employs a contact stabilization type of activated sludge biological treatment. The tertiary step is gravity filtration, in which secondary effluent filters through layers of anthracite and sand. Instruments in the plant's control station continuously monitor effluent flow volume, pH, chlorine residual and other key operating indicators. Switches at a single panel permit control of aeration tank blowers, settling basin skimmers, sludge concentrator and filter pumps. (Sandoski-FIRL)
W75-00192

EXPANSION SPARKS NEW DESIGN,
Malcolm Pirnie, Inc., White Plains, N.Y.
G. P. Westerhoff.
Water and Wastes Engineering, Vol 11, No 6, p 44, 46, 66, June, 1974. 1 fig, 1 tab.

Descriptors: *Pre-treatment(Water), *Project planning, Evaluation, *Treatment facilities, *New York, Operations, *Waste water treatment, Turbidity, Filtration, *Design, Aeration, Flocculation, Sedimentation.
Identifiers: Sturgeon Point(NY).

A report outlining a program for the evaluation and testing of plant pre-treatment on a full plant scale including a six-month study program was initiated in conjunction with the reviewing authority in 1973 at the Sturgeon Point, New York plant. Results of the study and the recommendations for future plant operations are presented. The water treatment processes at Sturgeon Point consist of aeration, chemical addition, rapid mixing, flocculation and sedimentation, followed by filtration and chlorination. The study program required turbidity measurements at several critical points and used continuous-sampling and recording turbidimeters to measure turbidity. Examinations for total microscopic count were made during the filtration study as an additional indicator of water quality during the testing program. Based on the results of the one-year filtration study program, filtered water quality goals were established for the Sturgeon Point Water Treatment Plant. These goals should be met consistently, with the existing

standard pre-treatment presently approved by the State Department of Health. (Sandoski-FIRL)
W75-00193

MICROBIOLOGY: DETECTION, OCCURRENCE, AND REMOVAL OF VIRUSES,
National Environmental Research Center, Cincinnati, Ohio.
For primary bibliographic entry see Field 5A.
W75-00199

VARIABLES TO BE MEASURED IN WASTEWATER TREATMENT PLANT MONITORING CONTROL,
Environmental Protection Agency, Cincinnati, Ohio.
F. Roesler, and R. H. Wise.
Journal of the Water Pollution Control Federation, Vol 46, No 7, p 1769-1775, July, 1974. 23 ref.

Descriptors: *Waste water treatment, *Effluent control, *Biological waste treatment, Automation, Suspended solids.
Identifiers: *Process control, Automatic backwashing, Rapid sand filters, Substrate variables.

Process control can be interpreted as the adjustment of key process variables on a continual or intermittent basis of maximum performance while minimizing cost. The control of the key variables affects quality, while control of the other variables only reduces cost. Automatic backwashing of rapid sand filters responding to head loss through the filter is an example of control with an indirect affect on effluent quality and cost. The key variables in biological waste treatment processes are classified into four categories: substrate variables, physical and chemical variables, suspended solids variables, and biological activity variables. These groups are discussed in terms of their limitations and relationships to each other, plant performance and process control strategies. (Leibowitz-FIRL)
W75-00211

OPERATING A SMALL CONTACT STABILIZATION PLANT,
Weedsport Dept. of Public Works, N.Y.
R. D. Black, and W. C. Anderson.
Water and Sewage Works, Vol 121, No 6, p 78-81, June, 1974. 2 ref.

Descriptors: *Waste water treatment, *Treatment facilities, Design criteria, Equipment, Aeration, Chlorination, Solid wastes, Performance, Economics, *New York.
Identifiers: *Weedsport(NY).

Operating experiences at the Weedsport, New York waste water treatment plant are recounted. The problems encountered and the solutions implemented are offered as suggestions for the design, construction, and operation of other such treatment facilities. A description of the community and the waste water treatment plant is detailed with specific mention of the aeration, solids handling, and chlorination steps in the plant. Equipment purchasing and costs are mentioned and the performance of the facility is indicated. (Sandoski-FIRL)
W75-00214

CHEMICAL AND TERTIARY TREATMENT UNITS.
Johnson (A.) Construction Co. Ltd. (Scotland). Inka Div.
Water and Waste Treatment, Vol 17, No 5, p 20, May, 1974.

Descriptors: *Waste water treatment, *Tertiary treatment, *Nutrient removal, Sludge treatment, Flocculation, Precipitation, Sewage treatment, Water pollution, Phosphorus, Nutrient removal.
Identifiers: Chemical dosing.

Various systems have been developed to utilize chemical and tertiary treatment for waste water purification by the Inka Division of the northern Scotland company. The treatment process has three main steps, which are: (1) mechanical operations of screening and grit removal, (2) biological activated sludge treatment followed by settlement, (3) and chemical dosing, flocculation and precipitation. The separated sludges are fed into aerobic digesters before sludge processing. This form of treatment will generally produce an effluent quality better than 10/10 standard with 90 to 95 percent total removal of phosphorus. Currently being used by the A. Johnson Construction Company is a biological sewage treatment plant with tertiary treatment and nutrient reduction. The effluent discharged into a small stream necessitated a high effluent quality. The nutrient removal prevents unwanted algal growth. (Leibowitz-FIRL)
W75-00215

PHYSICO-CHEMICAL AND TERTIARY TREATMENT,
Evers (D.) and Associates, Lichfield (Birming) (England).
D. Evers.
Water and Waste Treatment, Vol 17, No 5, p 13-14, May, 1974.

Descriptors: *Tertiary treatment, *Water purification, *Effluent control, Water pollution, Dyes, Sewage treatment, Waste water treatment, Gas chromatography, Industrial waste.
Identifiers: Physico-chemical treatment.

Through a simple physico-chemical treatment, dyes of all types can be removed sucessfully from water along with the elimination of remaining substances. Gas chromatograms of the compounds taken from the water treated prove the effectiveness of this treatment. The purification effect can be controlled and continued until drinking water quality is reached. The process is insensitive to disinfectants, temperature, and intermittent discharge. There is no feed-in phase, and the water may be recirculated. Cost is very low, and the space needed amounts to approximately 6x3x3 m for a 5 cu m/hr. unit. The sludge produced is firm and may be further processed to obtain scatter manure with no odor. No long pipe-lines are needed. Minimal attendence is required. (Leibowitz-FIRL)
W75-00216

PROCEEDINGS OF FOURHT ANNUAL SYMPOSIUM ON ENVIRONMENTAL POLLUTION, 4-5 APRIL 1973, SPONSORED BY THE AMERICAN ORDNANCE ASSOCIATION.
Available from NTIS, Springfield, Va. 22161 as AD-771 044 Price $5.75 printed copy; $2.25 microfiche. Edgewood Arsenal, Maryland, Special Publication EO-SP-73001 (EASP 1800-16), September 1973. 148 p.

Descriptors: *Pollution abatement, *Military aspects, *Conferences, Hazards, Recycling, Water pollution control, Legislation, Explosives, Poisons, Water pollution sources, Waste disposal, Chemical wastes, Industrial wastes.
Identifiers: *Hazardous material control, Hazardous material disposal.

The fourth annual symposium on environmental pollution at Edgewood Arsenal on April 4-5, 1973 was to serve as a forum for the relevant Government agencies and industry to exchange information on the various facets of reclamation and disposal of hazardous materials. This report contains presentations by representatives of the Department of Defense, the Environmental Protection Agency, the Atomic Energy Commission, and industry. (See W75-00250 thru W75-00259) (Knapp-USGS)
W75-00249

HAZARDOUS MATERIALS CONTROL PROGRAMS IN THE DEPARTMENT OF DEFENSE,
Environmental Protection Agency, Washington, D.C.
R. J. Walsh.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 17-19, September 1973.

Descriptors: *Pollution abatement, *Military aspects, *Conferences, Hazards, Recycling, Water pollution control, Legislation, Explosives, Poisons, Water pollution sources, Waste disposal, Chemical wastes, Industrial wastes.
Identifiers: *Hazardous material control, Hazardous material disposal.

The Defense Department has been successful in coping with environmental quality matters in response to national programs. The management of hazardous substances has been integrated within the overall environmental quality effort. DOD policy calls for complying with Federal, State, and local standards. In attacking hazardous wastes, DOD is guided by the principle that the environment is a closed system and that many pollutants are potential resources which are temporarily out of place. New legislation on water pollution, pesticides, and ocean disposal has specific provisions for controlling hazardous substances which will affect DOD guide DOD planners and managers in deciding the best alternative to choose when making major decisions affecting environmental quality. (See also W75-00249) (Knapp-USGS)
W75-00250

DEPARTMENT OF DEFENSE RESEARCH AND DEVELOPMENT IN HAZARDOUS MATERIAL DISPOSAL,
Office of the Director of Defense Research and Engineering, Washington, D.C.
T. R. Dashiell.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 21-24, September 1973, 1 tab.

Descriptors: *Pollution abatement, *Military aspects, *Conferences, Hazards, Recycling, Water pollution control, Legislation, Explosives, Poisons, Water pollution sources, Waste disposal, Chemical wastes, Industrial wastes.
Identifiers: *Hazardous material control, Hazardous material disposal.

Many materials handled within Department of Defense activities are hazardous. These include explosives, propellants, some industrial chemicals and industrial wastes, and radioactive materials. To address these and other environmental quality research and development programs, the Director of Defense Research and Engineering prepared an Area Coordinating Paper (ACP) to assess the needs to meet system requirements, determine technology deficiencies by comparison of needs with current research and development programs, develop new research and development programs to meet needs, and provide general guidance to the military departments. (See also W75-00249) (Knapp-USGS)
W75-00251

NAVAL ORDNANCE RDTE PROGRAM ON POLLUTION ABATEMENT,
Naval Ordnance Systems Command, Washington, D.C.
D. J. Quagliarello, and A. B. Amster.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-

73001 (EASP 1800-16), p 25-59, September 1973. 27 fig.

Descriptors: *Pollution abatement, *Military aspects, *Conferences, Hazards, Recycling, Water pollution control, Legislation, Explosives, Poisons, Water pollution sources, Waste disposal, Chemical wastes, Industrial wastes.
Identifiers: *Hazardous material control, Hazardous material disposal.

The Navy's research program in the field of ordnance pollution abatement is reviewed. The program covers manufacturing, reclamation, and disposal of propellants, explosives, and pyrotechnics. The operating conditions before the program began, the extent of the problem, and the processes and equipment used and under development for pollution abatement are discussed. As of 30 October 1972, a total of 88,600 tons of propellants and explosives were stored for disposal. Each year, thousands of tons of scrap or reject propellants and explosives are burned in the open air. Ocean dumping has been halted by the Secretary of Defense. (See also W75-00249) (Knapp-USGS)
W75-00252

POLLUTION CONTROL FROM EXPLOSIVE PRODUCTION WASTE STREAMS,
Picatinny Arsenal, Dover, N.J.
G. R. Eskelund.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 67-81, September 1973. 12 fig.

Descriptors: *Pollution abatement, *Military aspects, *Conferences, Hazards, Recycling, Water pollution control, Legislation, Explosives, Poisons, Water pollution sources, Waste disposal, Chemical wastes, Industrial wastes.
Identifiers: *Hazardous material control, Hazardous material disposal.

Some typical waste streams in each category from explosive manufacture are discussed. Not all pollutants derived from explosive manufacturing are unique. There are, however, problems associated with these pollutants due to the quantites of waste involved or mixtures of ingredients which pose special handling difficulties. The goal of the Army in pollution control is to close the loop on waste streams and reuse or recycle as much material as possible. (See also W75-00249) (Knapp-USGS)
W75-00253

PREVENTION AND CONTROL OF HAZARDOUS MATERIAL SPILLS,
Environmental Protection Agency, Washington, D.C. Hazardous Material Spill Control Program.
For primary bibliographic entry see Field 5G.
W75-00254

ADVANCES IN RECLAMATION TECHNOLOGY BY HIGH-TEMPERATURE INCINERATION,
IIT Research Inst., Chicago, Ill.
W. B. Crandall.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), P (+=+)>, September 1973. 8 fig, 5 tab, 6 ref.

Descriptors: *Incineration, *Muncipal wastes, *Industrial wastes, *Farm wastes, *Recycling, Waste disposal Economics, Costs, Water pollution control.

High-temperature incineration is used to treat both municipal and industrial waste products. Combining wastes in thermal processing increases the potential of making the operation cost effective. Food and organic matter in municipal wastes and farm and other organic materials combined with industrial wastes add sufficient energy to make many of these processes thermally self-supporting. Examples of products formed from the waste materials are discussed along with the economic returns possible from this type of operation. (See also W75-00249) (Knapp-USGS)
W75-00255

NATIONAL DISPOSAL SITES FOR HAZARDOUS WASTES,
Environmental Protection Agency, Washington, D.C. Office of Solid Waste Programs.
For primary bibliographic entry see Field 5E.
W75-00256

NUCLEAR WASTE DISPOSAL,
Oak Ridge National Lab, Tenn.
For primary bibliographic entry see Field 5E.
W75-00257

USE OF SALT REPOSITORIES FOR LONG-TERM RETENTION OF HAZARDOUS WASTE MATERIAL,
For primary bibliographic entry see Field 5E.
W75-00258

THE EDGEWOOD ARSENAL ROLE IN ENVIRONMENTAL TECHNOLOGY,
Edgewood Arsenal, Aberdeen Proving Ground, Md.
A. E. Hilsmeier.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 139-148, September 1973, 6 fig.

Descriptors: *Water pollution control, *Military aspects, *Waste disposal, Research and development, Chemcial wastes, Industrial wastes, Monitoring, Water pollution treatment.

The sceintific and technological resources of Edgewood Arsenal, developed for the Department of Defense chemical-biological defense mission, are suited to the work of solving many pollution problems. Among the areas of the arsenal's experience and technology are chemical engineering, life sciences, chemistry, electrical engineering, physics, and ecology. Edgewood Arsenal's resources are being applied to the Army's environmental program in several ways. In addition to managing and engineering its own in-house pollution control and abatement effort, the arsenal has been assigned the following aspects of the Army's program: surveying the ecology of areas around manufacturing plants; studying the needs for instrumentation and the monitoring of pollutants; and proposing chemical and toxicological studies for establishing environmental quality standards and managing the water problem at many of the Army's installations. (See also W75-00249) (Knapp-USGS)
W75-00259

RATE OF THERMAL REGENERATION OF ACTIVATED CARBON,
Connecticut Univ., Storrs. Inst. of Water Resources.
H. E. Klei, and D. W. Sundstrom.
Available from National Technical Information Service, Springfield, Va 22161, as PB-236 791, $3.25 in paper copy, $2.25 in microfiche. Completion Report, September, 1974. 11 p, 6 fig. 14-31-0001-3807. OWRT A-045-CONN(1).

Descriptors: *Activated carbon, *Kinetics, *Waste water treatment, *Water pollution, Adsorption.
Identifiers: *Thermal regeneration, *Carbon-steam reaction, Gas-flow rate, External mass transfer rate.

Activated carbon was reacted with steam at varying gas flow rates, steam concentrations and temperatures. The reaction kinetics varied with the steam concentration to the 0.58 power and had an activation energy of 63.6 kcal/g mole. The reaction rate was found to be a function of gas flow rate, indicating the importance of external mass transport. Significant amounts of either chlorophenol or methylene blue remained on the carbon when heated to 1000F requiring regeneration with the steam. (de Lara-Connecticut)
W75-00264

TEMPORARY DETENTION OF STORM AND COMBINED SEWAGE IN NATURAL UNDERGROUND FORMATIONS,
R. A. Hudak, and T. J. McMahon.
Copy available from GPO Sup Doc as EP1.23/2:73-242, $0.95; microfiche from NTIS, Springfield, Va 22161 as PB-227 345, $2.25. Environmental Protection Agency, Technology Series, Report EPA-R2-73-242, May, 1973. 70 p, 26 fig, 7 tab, append. EPA 11030DSL.

Descriptors: *Combined sewers, *Sewage, *Underground storage, Storm water, *Resistivity, *Borehole geophysics, Subsurface investigations, Waste water treatment, Water pollution control, Feasibility studies.

The object was to demonstrate the feasibility of temporarily detaining storm and combined sewage in natural underground formations. Based on tests taken at five selected sites along the City of St. Paul riverfront, the most suitable location permitted a maximum injection rate of 1,000 GPM, or 1,400,000 gallons-per-day. A rainfall equivalent to the test areas' five-year-storm frequency would result in some 70-million gallons of runoff, or a peak rate of over 2,500,000 GPM. Thus, the obvious necessity of providing storage basins to minimize the number and size of injection systems. The studies point to a need to remove all solids larger than 5-microns. To accomplish this, sedimentation basins, chemical flocculation, and the use of sand filters or fine screens would be required. The potential for contamination of underground water supply sources must also be carefully evaluated where such methods are considered. It was determined that facility requirements were not economically feasible in view of other methods available. In view of the need for sedimentation, flocculation, and filters or screens--it appears that, with few additions, the effluent could be discharged directly to the river. (EPA)
W75-00274

SITE EVALUATION AND DESIGN OF SEEPAGE FIELDS,
Connecticut Univ., Storrs. Dept. of Civil Engineering.
K. A. Healy, and R. Laak.
Journal of the Environmental Engineering Division, American Society of Civil Engineers, Vol 100, No EE5, Proceedings Paper 10882, p 1133-1146, October 1974. 7 fig, 2 tab, 15 ref, 3 append.

Descriptors: *Seepage, *Groundwater recharge, *Infiltration, *Septic tanks, *Sewage disposal, *Domestic wastes, *Connecticut, Flow nets, Seepage control, Disposal, Percolation, Water pollution sources, Water pollution, Absorption, Permeability, Waste water disposal, Subsurface drainage, Tiles, Hydraulic conductivity, Effluents, Environmental engineering.
Identifiers: *Mansfield(Conn), Seepage fields, Pit permeability tests.

A reevaluation of previous work by others indicated that soil can absorb septic tank effluent indefinitely if the application rate is kept below a cetain level, which is a function of soil permeabili-

ty. This long-term acceptance rate is independent of whether the soil is continuously or intermittently flooded, and varies from approximately 0.3 gpd/sq ft (0.01 m/day) for clay loam and silt to approximately 0.8 gpd/sq ft (0.03 m/day) for sand. Study of the groundwater flow pattern below a seepage field showed that it is, in many cases, the hydraulic conductivity of the ground surrounding the field, as determined by the external water table, soil permeability, and impervious strata, that controls the size of the field required. These three factors were determined by a test pit dug at seven sites in the Mansfield, Connecticut area. Pit permeability tests were developed and results compared favorably with tube sample permeameter tests. Based on the information obtained, a chart was prepared to aid in designing a seepage field. Two design examples were included. (Sanderson-ISWS)
W75-00333

WASTEWATER TREATMENT IN FISH PROCESSING,
Wisconsin Univ., Madison. Dept. of Food Science; and Wisconsin Univ., Madison. Dept. of Engineering.
D. A. Stuiber, and J. T. Quigley.
Wisconsin University Sea Grant College Reprint, WIS-SG-74-345, Reprinted from Proceedings of the Sixteenth Conference on Great Lakes Research, April 1973. p 958-966, 5 fig, 4 tab, 3 ref.

Descriptors: *Fish handling facilities, *Waste water treatment, *Pollution abatement, *Lake Michigan, Organic wastes, Water purification, Industrial wastes.
Identifiers: Food processing industry, Anaerobic treatment, Alewife.

A stick liquor or wastewater discharge from a commercial alewife processor operating on Lake Michigan was studied in two stages. First, the basic fish mean process in use at the processing plant, which was similar to that described by Brody as 'fish reduction', was not changed. Stick liquor resulting from the pressing operation was heated to 185F, centrifuged to remove oil and discharged for wastewater treatment. Coagulation with glutaric dialdehyde at elevated temperatures and low pH appeared to be an effective, economical, additional processing step to increase suspended solids removal and product recovery when tested on a laboratory scale. Secondly, owing to the complexity of the material in the wastewater discharge, an anaerobic treatment stage was found to be required. Accordingly, design focused on combination anaerobic-aerobic systems. Designs and cost estimates for the two-stage lagoon system were developed based upon laboratory findings and known process parameters. For an operating stick liquor flow of 1400 gallons per hour and an assumed 'typical' operating calendar, the anaerobic lagoon design called for a volume of 188,000 cubic feet, while the mechanically aerated units totalled 134,000 cubic feet. The two-stage total treatment cost was estimated to be $12,000.00 per year. (Author) (NOAA)
W75-00507

ELIMINATION OF SALMONELLAE BY BIOLOGICAL TREATMENT OF WASTEWATER, (IN GERMAN),
L. Popp.
Zentralbl Bakteriol Parasitenkd Infektionskr Hyg Erste Abt Orig Reihe B Hyg Praev Med. Vol 157, No 2/3, p 184-195, 1973. English summary.

Descriptors: *Filtration, *Salmonellae, *Waste water treatment, Activated sludge, Trickling filters, Biological treatment, Settling basins.

In a wastewater treatment plant with a capacity of 8-9000 cu m/day and 2-stage biological treatment, semiquantitative examinations for salmonellae are made of samples, taken at the following points: effluent of primary plain sedimentation basin, effluent of plain sedimentation basin following activated-sludge treatment (1st biological stage) and effluent of plain sedimentation basin following trickling filtration (2nd biological stage). Wastewater sampled from these 3 effluents at 10 days in 3 successive weeks contained 14 species of Salmonella. In the biological stages more species were present per day than in the effluent of primary sedimentation. The minimal quantity of wastewater containing Salmonellae averged 0,1 ml at the 3 points of sampling. No removal of Salmonellae was brought about by biological treatment. In the receiving river (runoff during winter about 9 cu m/s) samples are taken at a point 10 km down stream of treatment plant. Of the 14 Salmonella species, 8 found in wastewater were present in the river and all 17 daily samples taken during the investigation period in the plant contained 1 or more species. Semiquantitative examinations for Salmonellae of 41 daily samples of water from the involved river was also made. All daily samples contained Salmonellae and 17 species of Salmonellae were isolated. The minimal quantity of water containing Salmonellae in the river averaged 10 ml. The amounts of Salmonellae 10 km down stream of the sewage treatment plant correspond to the 1:100 dilution of wastewater by the runoff of the river. No essential effect of self-purification in the receiving water was seen. The isolation of Salmonellae was made by repeated enrichement of wastewater and water in 2% Kaliumtetrathionate broth, with following subculture on Wilson-Blair-Medium. Disinfection of effluents should be considered.--Copyright 1974, Biological Abstracts, Inc.
W75-00536

5E. Ultimate Disposal Of Wastes

THE PROBLEMS OF THE DISCHARGE AND OF THE TREATMENT OF THE WASTE WATERS OF THE PARIS URBAN AGGLOMERATION (LES PROBLEMES D'EVACUATION ET DE TRAITEMENT DES EAUX USEES DE L'AGGLOMERATION PARISIENNE),
For primary bibliographic entry see Field 5D.
W75-00151

TREATMENT AND DIGESTION OF SEWAGE SLUDGE PRODUCED BY WASTEWATER TREATMENT PLANTS (TRATTAMENTO E SMALTIMENTO DEI FANGHI PRODOTTI DAGLI IMPIANTI DI DEPURAZIONE DELLE ACQUE DI SCARICO),
For primary bibliographic entry see Field 5D.
W75-00153

LIFTING THE LID OFF PITSEA,.
For primary bibliographic entry see Field 5D.
W75-00180

U.S. NAVY JETTISONS 'HEAVE-HO' HANDLING OF PACKAGING ITEMS AT SEA.
For primary bibliographic entry see Field 5G.
W75-00181

RADIOACTIVE WASTES,
Minnesota Univ., Minneapolis.
For primary bibliographic entry see Field 5B.
W75-00202

RADIOACTIVE WASTE STORAGE IN THE ARID ZONE,
Geological Survey, Reston, Va.
I. J. Winograd.
EOS (American Geophysical Union Transactions), Vol 55, No 10, p 884-894, October 1974. 1 fig, 1 tab, 77 ref.

Descriptors: *Radioactive waste disposal, *Arid lands, *Underground waste disposal, Underground storage, Soil water movement, Groundwater movement, Nuclear wastes, Path of pollutants, Unsaturaged flow.
Identifiers: *Unsaturated zone.

Storage of radioactive wastes in very thick (100-600 m) unsaturated zones found locally in the Southwest is evaluated. The unsaturated zone, also commonly referred to as the vadose zone or zone or aeration, comprises the consolidated or unconsolidated rocks between the land surface and the water table. The unsaturated zone is currently being used for the disposal and storage of liquid and (or) solid low-and intermediate-level wastes at Hanford, Washington; Idaho Falls, Idaho; and other places. The several hundred thousand years needed for decay of the transuranic elements effectively preclude use of thick unsaturated zones as repositories for many wastes. Removal of the transuranic elements might make unsaturated-zone-storage an attractive compromise between surface storage in concrete vaults and deep disposal in bedded salt or other geologic media. Storage in thick unsaturated zones appears suitable for isolating long-lived fission products Sr-90/and Cs-137 from the hydrosphere and biosphere for the 600-1000 yr needed for decay of these nuclides and in addition offers the possibility of relative ease of retrievability and only nominal surveillance. Thick unsaturated zones beneath deserts of the world (some possibly overlying tectonically stable platform areas) constitute unused space with a potentially significant capacity to buffer the environment against degradation by a variety of solidified toxic as well as radioactive wastes. (Knapp-USGS)
W75-00247

PROCEEDINGS OF FOURHT ANNUAL SYMPOSIUM ON ENVIRONMENTAL POLLUTION, 4-5 APRIL 1973, SPONSORED BY THE AMERICAN ORDNANCE ASSOCIATION.
For primary bibliographic entry see Field 5D.
W75-00249

HAZARDOUS MATERIALS CONTROL PROGRAMS IN THE DEPARTMENT OF DEFENSE,
Environmental Protection Agency, Washington, D.C.
For primary bibliographic entry see Field 5D.
W75-00250

DEPARTMENT OF DEFENSE RESEARCH AND DEVELOPMENT IN HAZARDOUS MATERIAL DISPOSAL,
Office of the Director of Defense Research and Engineering, Washington, D.C.
For primary bibliographic entry see Field 5D.
W75-00251

NAVAL ORDNANCE RDTE PROGRAM ON POLLUTION ABATEMENT,
Naval Ordnance Systems Command, Washington, D.C.
For primary bibliographic entry see Field 5D.
W75-00252

ADVANCES IN RECLAMATION TECHNOLOGY BY HIGH-TEMPERATURE INCINERATION,
IIT Research Inst., Chicago, Ill.
For primary bibliographic entry see Field 5D.
W75-00255

NATIONAL DISPOSAL SITES FOR HAZARDOUS WASTES,
Environmental Protection Agency, Washington, D.C. Office of Solid Waste Programs.
S. Morekas.

In: Proceedings of 4th Annual Symposium on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 111-114, September 1973.

Descriptors: *Waste disposal, *Water pollution control, Radioactive wastes, Poisons, Industrial wastes, Chemical wastes, Planning.
Identifiers: *Environmental Protection Agency, *Hazardous wastes, *Disposal sites.

The Resource Recovery Act of 1970 calls for a plan for creating 'a system of National Disposal Sites for the storage and disposal of hazardous wastes, including radioactive, toxic-chemical, biological, and other wastes which may endanger public health or welfare.' The Environmental Protection Agency (EPA) is completing its report on the development of a disposal plan; the report is scheduled for submission to the Congress in June 1973. Contract work to support planning included: (1) hazardous waste disposal survey, (2) study of current and recommended hazardous waste management methods, (3) research on public attitudes toward disposal of hazardous wastes, (4) alternatives to a system of national disposal sites, and (5) a feasibility study for development of a system of hazardous waste national disposal sites. (See also W75-00249) (Knapp-USGS)
W75-00256

NUCLEAR WASTE DISPOSAL,
Oak Ridge National Lab, Tenn.
W. D. Burch.
In: Proceedings of 4th Annual Symposium on Environmental Pollution, Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 119-127, September 1973, 4 fig, 8 ref.

Descriptors: *Radioactive waste disposal, *Nuclear wastes, Industrial wastes, Underground waste disposal, Underground storage.

Methods for the disposal of fission product and other wastes from reactor fuel reprocessing plants are studied in a major research program. A slow and rather deliberate approach is being followed in order to gain public confidence and acceptance of the scheme finally chosen. Decisions have already been made to provide a Federal repository in which all these waters must be disposed. The most promising long-term solution seems to be disposal in salt formations 1000 feet or more underground. A test of this method in a Kansas salt mine was successful, but some technical questions about unknown, abandoned wells drilled through the site and the solution mining operation in an adjacent site led to public and political opposition and a decision to seek a more isolated location. In the meantime, the AEC has decided to provide surface engineered storage facilities for interim storage of these wastes for the next 10 to 30 years. Whenever a geologic system which requires no continuous surveillance has been developed and fully accepted, the engineered storage would be phased out. Major efforts are also being devoted to finding disposal methods for the 90 million gallons of high-level wastes stored in underground tanks from the plutonium production programs. Onsite schemes are being sought for purposes of economy, but shipment to the Federal repository may be required if no acceptable onsite method is found. (See also W75-00249) (Knapp-USGS)
W75-00257

USE OF SALT REPOSITORIES FOR LONG-TERM RETENTION OF HAZARDOUS WASTE MATERIAL,
C. T. Brandt.
In: Proceedings of 4th Annual Symposium on Environmental Pollution. April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 129-138, September 1973.

Descriptors: *Radioactive waste disposal, *Nuclear wastes, Industrial wastes, Underground waste disposal, Underground storage.

Long-term retention of hazardous wastes such as high-level radiactive material is possible in geologic structures. Storage in chambers created in naturally existing salt formations offers the most promise. In spite of the practicality of this proposal, underground storage appears to remain generally objectionable and is not being used. The origin, downfall, and subsequent effect of the ill-fated Lyons, Kansas, project are reviewed. (See also W75-00249) (Knapp-USGS)
W75-00258

THE EDGEWOOD ARSENAL ROLE IN ENVIRONMENTAL TECHNOLOGY,
Edgewood Arsenal, Aberdeen Proving Ground, Md.
For primary bibliographic entry see Field 5D.
W75-00259

FIELD STUDY OF AN UNCONFINED SPOIL DISPOSAL AREA OF THE GULF INTRACOASTAL WATERWAY IN GALVESTON BAY, TEXAS,
Texas A and M Univ., College Station. Coastal and Ocean Engineering Div.
D. E. Bassi, and D. R. Basco.
Texas A and M University Sea Grant College, TAMU-SG-74-208 and C.O.E. Report No 174, January 1974. 83 p, 14 fig, 4 tab, 47 ref, appendix.

Descriptors: *Bottom sediments, *Sediment distribution, *Path of pollutants, *Texas, Dredging, Spoil banks.
Identifiers: *Dredge spoil, *Tidal currents, *Spoil disposal, Grain size analysis, *Galveston Bay(Texas).

Dredge spoil obtained from maintenance dredging of the Gulf Intracoastal Waterway is presently disposed in unconfined, submerged spoil areas alongside the channel. Grain size analysis of bottom sediment samples, depth soundings and wooden stakes were employed in field investigations to determine the approximate location of material from one such spoil area over a five month period after disposal. Immediately following deposition, over 40 percent of the spoil (based on original in-channel volume) had left the designated spoil area and spread out over the bay floor primarily as a mud-density flow. Eventually spoil covered an area about three times larger than the original spoil area. Return of the spoil to the newly dredged channel did not appear significant during the study period primarily because of the predominant direction of tidal currents and due to the presence of a submerged dike along the channel. A brief summary of dredging and spoil disposal practices is also included. (NOAA)
W75-00506

5F. Water Treatment and Quality Alteration

FEASIBILITY STUDY, LAKE HOPE MINE DRAINAGE DEMONSTRATION PROJECT.
Ohio/Dept. of Natural Resources, Columbus.
For primary bibliographic entry see Field 5G.
W75-00011

DESIGN OF BASIN COLLECTION TROUGHS,
Envirex, Inc., Waukesha, Wis.
For primary bibliographic entry see Field 8A.
W75-00125

WATER TREATMENT PLANT DESIGN IS FLEXIBLE,
K. A. Bollinger.
Water and Sewage Works, p 116-118, April 30, 1974.

Descriptors: *Water treatment, *Treatment facilities, Hardness(Water), Design criteria, Operation and maintenance, Equipment, Automation, *Michigan, Waste water treatment.
Identifiers: Allegan(Mich).

In 1968 the city of Allegan, Michigan began construction of a water treatment system that would replace the hard water supplied by natural wells located in the valley of the Kalamazoo River. The treatment plant was designed by Williams and Works of Grand Rapids, Michigan. The design capacity is 3 mgd, the hydraulic capacity is 4 mgd. The plant flow sheet provides flexibility in hardness removal, as either a split or straight lime system. For most of the year, the split treatment provides softening to 130 mg/liter, iron removal, taste and odor control and disinfection. The plant can be operated by means of manual, automatic, or remote control methods. The control panel is located in the laboratory so that the equipment and processes can be under constant observation. (Sandoski-FIRL)
W75-00126

PRODUCTS AND PROCESSES FOR THE TREATMENT AND CONDITIONING OF WATER (PRODUITS ET PROCEDES DE TRAITEMENT ET DE CONDITIONNEMENT DES EAUX).
For primary bibliographic entry see Field 5D.
W75-00129

STUDY OF THE WATER PURIFICATION BY MEANS OF ELECTROLYZER WITH ALUMINUM ANODE (ISSLEDOVANIYE PROTSESSA OCHISTKI VODY V ELEKTROLIZERE S ALYUMINIYEVYM ANODOM),
P. P. Strokach, V. A. Slipchenko, L. A. Kul'skiy, and V. P. Belaya.
Elektronnaya Obrabotka Metallov, No 4, p 41-45, 1973. 3 fig, 3 tab, 16 ref.

Descriptors: *Water purification, *Aluminum, Flow rate, Pollutants, Iron, Suspended solids, Phytoplankton, Water treatment.
Identifiers: *Electrocoagulation, *Electrolyzers, Oxygen removal.

The physiocochemical, electrical and hydrodynamic factors influencing the efficiency of the electrocoagulation method of water purification in the removal of silicon, iron, and oxygen from water were studied in laboratory experiments, using aluminum anode. The optimum pH values for the removal of silicon and iron, as well as phytoplankton and suspended matter were found to be 6.5-9, 8.2 and over, and 4-7, respectively. Finely dispersed clay particles increased the purification efficiency, while humus matter interfered with the purification. The increase of the water flow rate in the electrode zone from 1.6 to 70 m/sec had practically no effect on the efficiency of the removal of silicon and iron, and the efficiency was largely determined by the quantity of the aluminum hydroxide available for adsorption. The increase in the flow rate decreased the efficiency of oxygen removal. Increased current density resulted in reduced efficiency of iron and silicon removal, and in slight increase in the efficiency for oxygen removal. The optimum values of the current density and of the electrode potential were found to be 1-2 mA/sq cm and 2.5-4 V, under which conditions economical removal of pollutants, such as silicon, iron, coloring contaminants, suspended matter, phytoplankton, and oxygen was possible at an efficiency of 60-80 percent. (Takacs-FIRL)
W75-00147

CONSIDERATIONS ON ARTIFICIAL GROUNDWATER RECHARGE (NACHDENKLICHES ZUR KUENSTLICHEN GRUNDWASSERANREICHERUNG),
For primary bibliographic entry see Field 4B.
W75-00166

SATISFYING VENEZUELA'S QUALITY WATER REQUIREMENTS.
Rohm and Haas Reporter, Vol 32, No 2, p 20-23, Summer, 1974.

Descriptors: *Treatment facilities, *Water treatment, *Water quality control, Industrial plants, Equipment, Filters, *Activated carbon, Organic matter, Installation, Cation exchange, *Ion exchange.
Identifiers: *Venezuela.

A large and sophisticated conditioning plant that produces up to 780 gpm of ultra-high-quality water has been developed for a $50 million petrochemical complex near Moron, Venzuela. The system consists of three activated carbon filters for removal of organic matter; three cation exchange columns to remove sodium and hardness elements such as calcium and magnesium; a degasification tower to remove carbon dioxide; three anion exchange columns to remove mineral acidity to cation exchange resin treatment; and, two final polishing units to totally remove traces of silica and other mineral salts. The Illinois Water Treatment Company supplied part of the equipment and assisted in the design and installation phases. All of the cation exchanges columns are charged with Amberlite IR-120 and the anion exchange columns contain Amberlite IRA-402. The final polishing units contain a mixture of Amberlite IR-122 and Amberlite IRA-900. (Sandoski-FIRL)
W75-00179

BALTIMORE HAS A LOT GOING FOR IT--INCLUDING ITS WATER,
Baltimore Ashburton Purification and Filtration Plant, Md.
A. St. A. Ramsay.
National Engineer, Vol 78, No 5, p 11-12, May, 1974.

Descriptors: *Treatment facilities, *Water treatment, *Chlorination, Lime, Aluminum, *Filtration, Fluoridation, Corrosion control, Equipment, *Maryland, *Coagulation.
Identifiers: *Baltimore(Md).

In Baltimore as in other sections of the country where the mineral content of the raw water is low, the basic treatment procedure as outlined below is used for the two Montebello plants and the Ashburton plant. Chlorine as a sterilizing agent is applied to the water immediately after it passes through a meter which measures and records the rate of flow. Alum is used as a coagulating agent to collect the mud and suspended material in the raw water. The alum reacts with the alkalinity in the water and forms aluminum hydroxide which will precipitate as a floc. After mixing, the water moves into the settling basins. The basins are designed so that sufficient time elapses in the passage of the water for the particles of floc with their absorbed materials to settle to the bottom. The last step in clarifying the water is accomplished by passing it through about 20 inches of sand. Fluoridation of the water supply was begun in 1952. So as to counteract corrosiveness, lime is added to the filtered water in the amount of approximately one half grain per gallon. (Sandoski-FIRL)
W75-00188

PHYSICO-CHEMICAL AND TERTIARY TREATMENT,
Evers (D.) and Associates, Lichfield (Birming) (England).
For primary bibliographic entry see Field 5D.
W75-00216

TOLERANCE OF ESCHERICHIA COLI TO CADMIUM,
Johnston Labs., Inc., Cockeysville, Md.
A. A. Zwarun.
J Environ Qual. Vol 2, No 3, p 353-355. 1973. Illus.

Descriptors: *E Coli, *Cadmium, Toxicity, *Carbon-14, *Water treatment, Water pollution effects, Coliforms, Bacteria.

The effect of Cd on E. coli was studied by measuring the quantity of 14CO2 produced from 14C-glucose by the organism in the presence of increasing amounts of Cd. The test medium was a simulated freshwater source consisting of 0.01% soy peptone in sterile, deionized water (pH6). Decimal dilutions of Cd, as CdCl2, had no effect on the ability of the organism to produce 14CO2 in concentrations ranging from 0.006 micro g Cd/l to 0.6 mg Cd/1. At 6 mg Cd/1 a decrease in 14CO2 production was noticed, and a higher concentration of Cd reduced 14CO2 evolution even further. The decrease in 14CO2 evolution by E. coli could be correlated with a decrease in the number of cells surviving the Cd treatment.--Copyright 1974, Biological Abstracts, Inc.
W75-00347

DRINKING WATER LITHIUM AND MENTAL HOSPITAL ADMISSIONS,
Baylor Coll. of Medicine, Houston, Tex. Dept. of Psychiatry.
For primary bibliographic entry see Field 5C.
W75-00363

THE NEW ENGLAND WATER-UTILITY STORY,
Metcalf and Eddy, Inc., Boston, Mass.
For primary bibliographic entry see Field 5G.
W75-00538

5G. Water Quality Control

EFFECT OF A HYPOLIMNION DISCHARGE ON GROWTH OF BLUEGILL (LEPOMIS MACROCHIRUS) IN THE SAVANNAH RIVER, GEORGIA,
Georgia Univ., Athens. School of Forest Resources.
For primary bibliographic entry see Field 5C.
W75-00002

FEASIBILITY STUDY, LAKE HOPE MINE DRAINAGE DEMONSTRATION PROJECT.
Ohio/Dept. of Natural Resources, Columbus.
Copy available from GPO Sup Doc as EP1.23/2:73-151, $1.25; microfiche from NTIS, Springfield, Va. 22161 as PB-227 342, $2.25. Environmental Protection Agency, Technology Series Report EPA-R2-73-151, March 1973. 97 p, 15 fig, 6 tab, append. EPA Project 14010 HJQ.

Descriptors: *Mine drainage, *Feasibility studies, *Ohio, Wastes, Mine wastes, Water pollution control, Water quality, Monitoring.
Identifiers: *Lake Hope(Ohio), *Mine sealing.

The Lake Hope project will demonstrate the control and elimination of mine drainage pollution by refuse pile disposal and/or covering and underground mine sealings. Acid producing coal refuse will be removed and buried in suitably prepared sites. These sites will be finished graded and seeded. Non-acid producing coal mine refuse piles will be reshaped to existing contours, covered and reclaimed by appropriate seeding and tree planting for erosion control and aesthetic enhancement. The mine sealing demonstration program will be undertaken in two phases. The first phase will seal those mine openings which have been determined the most significant acid discharges and those openings immediately adjacent to or suspected of connecting with the high acid concentration discharge openings. The second phase will seal selected remaining mine openings as determined by the continuous water quality monitoring data obtained. Continuous water quality monitoring systems will obtain data to be evaluated over the life of the project and after all construction has been completed. (Harris-EPA)
W75-00011

A REVIEW OF ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGIES,
Battelle Columbus Labs., Ohio.
For primary bibliographic entry see Field 6G.
W75-00013

WATER POLLUTION TELEMETRY SYSTEM (IN JAPANESE),
For primary bibliographic entry see Field 5A.
W75-00108

WHY IT MAY COST 100 MILLION (POUNDS) TO CLEAN UP MERSEY SHORES,
B. Appleton.
New Civil Engineer, No 96, p 49-51, June 13, 1974.

Descriptors: *Mathematical models, *Water pollution, *Estuaries, Industrial wastes, Sewage disposal, Waste disposal, Oxygen requirements, Odor, *Water pollution control, Economics, Research and development.
Identifiers: *United Kingdom(Mersey estuary-Eng).

The Water Pollution Research Laboratory was commissioned to develop a mathematical model of the pollution of the Mersey estuary while a private company, JD and DM Watson investigated present sewage and industrial waste disposal and recommended remedial action. Targets of the investigation were: to ensure that the estuary water should at all times contain a sufficient level of oxygen to obviate odor nuisance; and, to obviate the fouling of the estuary foreshore and beaches by crude sewage or solids or fats from industrial effluents. These objectives and experimental findings are discussed. (Sandoski-FIRL)
W75-00110

THE USE OF A PROCESS COMPUTER IN AN ENVIRONMENTAL MONITORING SYSTEM,
Siemens und Halske A.G., Karlsruhe (West Germany). Measurement and Process Engineering Div.
G. Krenke, and D. Scholzke.
Siemens Review, Vol 41, No 4, p 170-174, April, 1974. 1 fig.

Descriptors: *Monitoring, *Computers, *Environmental effects, *Data processing, Purification, Pollutants, *Control systems, Automation.
Identifiers: Computer hardware, Computer software.

The necessity of maintaining or restoring a cleaner environment has presented a number of problems connected with the measuring of the impurities and the automating of the monitoring methods. A general concept was developed for a superregional environmental monitoring system. The first result of such work is a data aquisition and processing system which incorporates a process computer. This instrument plays the part of a central intelligent monitoring and control unit. The system has proven its value in trial operation, and conforms to the current ideas about the requirements that must be met by an environmental monitoring system. The hardware and software are flexible enough to satisfy future requirements. (Praque-FIRL)
W75-00111

GROUP CONSIDERS PROPER MANAGEMENT OF COASTAL AREAS.
For primary bibliographic entry see Field 6B.
W75-00113

ENVIRONMENT AND ECONOMIC GROWTH.
For primary bibliographic entry see Field 6G.
W75-00114

EUROPEAN WATER CLEANUP IS UNDER WAY,
D. O'Sullivan.
Environmental Science and Technology, Vol 8, No 7, p 602-604, July, 1974.

Descriptors: *Conferences, *Europe, *Industrial wastes, Waste water treatment, Waste disposal, Discharge(Water), Estuaries, Tidal waters, Taxes, Legislation.
Identifiers: Rhine River.

A three-day conference entitled 'Industrial Waste Water and Disposal Within the European Economic Community' centered mainly on the nine-member EEC countries, Belgium, Denmark, Italy, France, West Germany, Ireland, The Netherlands, England, and Luxembourg. Highlights of the meeting included: pollution of the Rhine, estuaries, and tidal reaches; taxes on effluent discharges; and, legislation and enforcement. (Sandoski-FIRL)
W75-00118

LOOKING TO EUROPE FOR A POLLUTION TAX MODEL. OR HOW THE CONSUMER WILL PAY.
Surveyor Public Authority Technology, No 4275 p 10-12, May 17, 1974.

Descriptors: *Economics, Conferences, *Europe, Industrial wastes, Waste water treatment, *Taxes, Treatment facilities, *Pollution taxes(Charges), *Water pollution control.

Economic aspects of the conference on industrial waste water treatment and disposal within the European Economic Community (EEC) are examined. Calculation of the pollution tax instituted in the Netherland according to the 1970 Surface Water Pollution Control Act, which imposes a pollution tax relating to the polluting load discharged, is described. Opposition to the principle of pollution-must-pay is voiced and the theory of consumer-will-pay advocated. It is concluded that uniformity is required and that centralized treatment facilities be developed. (Sandoski-FIRL)
W75-00119

HOW PURE IS OUR WATER SUPPLY.
Environmental Science and Technology, Vol 8, No 7, p 612, July, 1974.

Descriptors: *Water supply, *Water consumption, *Water resources, *United States, Industrial water, Water utilization, Recycling, Discharge(Water), Dissolved solids, *Water pollution control.

Water consumption has increased from 40 billion gpd in 1900 to 390 billion gpd in 1968. Home usage has been mainly for toilet flushing, bathing, and laundering; elsewhere, water is used for heating, cooling, cleaning, and as a solvent. Over 90 percent of the United States freshwater resources are underground. Yet only 20 percent is extracted for supply purposes. To achieve the national goal of zero discharge of pollutants to its navigable waters by 1958 will require the recycling of industrial process waste waters. In closing the influent/effluent gap, there still remains the problem of dissolved solids removal on a practical and economic basis. (Sandoski-FIRL)
W75-00122

OIL RECOVERY SYSTEM OPERATES EFFECTIVELY IN ROUGH WATER,
P. Gascoigne.
World Oil, Vol 178, No 7, p 93-94, June, 1974.

Descriptors: *Oil spills, *Skimming, Equipment, Storage tanks, Water pollution control, Oil pollution, Pollution abatement, *Separation techniques.

A versatile type of oil spill pickup equipment has been developed by MARCO Pollution Control Corporation, Seattle, Washington. The equipment is an oil skimmer which can operate efficiently even under bad weather conditions. The skimmer vessel is 58 feet long, 24 feet wide, weights 35 tons and is driven by twin 210-hp diesel engines. Oil is pumped into storage tanks by two 250-gpm guiding-type screw feed pumps. Special features of the system include oil sump heat exchangers, materials handling crane, screw conveyors in sumps, bow thrusters, combustible gas detection, and high intensity lighting. (Sandoski-FIRL)
W75-00124

FACTORS AFFECTING RESIDENTIAL WATER CONSUMPTION: THE MANAGERIAL VIEWPOINT,
Mississippi Univ., University. School of Business Administration.
For primary bibliographic entry see Field 6D.
W75-00139

WATER ANALYSIS IN THE KELETI CANAL (VIZVIZSGALATOK A KELETI FOCSATORNAN),
For primary bibliographic entry see Field 5B.
W75-00167

U.S. NAVY JETTISONS 'HEAVE-HO' HANDLING OF PACKAGING ITEMS AT SEA.
Solid Wastes Management/RRJ, Vol 17, No 6, p 22-23, 57-58, 66, 70, 72, June, 1974.

Descriptors: *Environmental control, Solid wastes, Navigable waters, *Water pollution control, *Waste disposal, *Water quality standards.

In compliance with executive orders, an environmental protection program has been initiated in a major effort to reduce or eliminate the wastes accumulated by Naval ships and currently disposed of at sea. The Navy has set a goal of reducing the amount of packaging materials going aboard ships by 50 percent over the next five years and by 75 percent in 15 years. Maximum usability will be sought for anything judged absolutely essential. Guidelines for hazardous materials, disposability and compactibility ratings of materials, as well as the feasibility of incineration approaches and establishing rough ratings are discussed. (Sandoski-FIRL)
W75-00181

MARINE AND ESTUARINE POLLUTION,
California State Univ., Long Beach. Dept. of Biology.
For primary bibliographic entry see Field 5B.
W75-00200

LEGAL ASPECTS OF THERMAL DISCHARGES,
Power Authority of State of New York.
For primary bibliographic entry see Field 6E.
W75-00203

MICROBIAL FOULING OF THE PIPES OF WATER COOLERS UPON THE APPLICATION OF POLLUTED CANAL WATER,
Ghent Rijksuniversiteit (Belgium). Dept. of General and Industrial Microbiology.
For primary bibliographic entry see Field 5C.
W75-00204

AN ANALYSIS OF STRIP MINING METHODS AND EQUIPMENT SELECTION,
Pennsylvania State Univ., University Park. Dept. of Mineral Engineering.
R. Stefanko, R. V. Ramani, and M. R. Ferko.
Department of Interior Office of Coal Research, Research and Development Report No 61 (Interim Report No 7), May 29, 1973. 134 p, 53 fig, 25 tab, 39 ref, append. USDI Contract 14-01-0001-390.

Descriptors: *Coal mines, *Strip mines, *Land reclamation, *Water pollution control, *Equipment, Strip mine wastes, Water pollution sources, Environment.
Identifiers: *Mining technology.

It is important to develop effective mining techniques that will permit strip mining with minimum ecological damage. All present day representative strip mining techniques, are reviewed, emphasizing the need to match equipment to natural conditions. Successful reclamation efforts have been made by various companies; this indicates what might be possible in the future. Past stripping has been done with inadequate regard for the environment. However, present technology is adequate to permit reclamation at reasonable costs, but reclamation must begin with the original design of the mining method. It must be an inherent part of the method, not an afterthought. This will permit the burying of acid materials and the placement of topsoil back near its original position at minimal costs. This is important because vegetation cannot be otherwise established, leading to air and water pollution in subsequent years.
W75-00233

DISCUSSION OF REGULATORY CRITERIA FOR OCEAN DISPOSAL OF DREDGED MATERIALS: ELUTRIATE TEST RATIONALE AND IMPLEMENTATION GUIDELINES,
Army Engineer Waterways Experiment Station, Vicksburg, Miss. Office of Dredged Material Research.
J. W. Keeley, and R. M. Engler.
Available from NTIS, Springfield, Va. 22161 as AD-775 826. Price $3.25 printed copy; $2.25 microfiche. Miscellaneous Paper D-74-14, March 1974. 13 p, 2 fig, 15 ref.

Descriptors: *Water pollution sources, *Dredging, *Water pollution control, *Water analysis, Laboratory tests, Water quality standards.
Identifiers: Elutriate test.

This report presents the rationale and guidelines for implementation of the Standard Elutriate Test. Criteria to predict the pollution potential of dredged material (sediments) must measure the sediment fraction that has a detrimental effect on water quality and the associated biota. Regulatory criteria should differentiate that fraction of a sediment that does not have an adverse effect on the environment from that fraction that does. The immediate bioavailable fraction of a sediment is dissolved in the sediment interstitual water or in an ionic form that is bound to the ion exchange fraction of the sediment. The elutriate test indicates those constituents in the interstitual water and those ions lossely bound to the ion exchange fraction and, therefore, is a viable criterion for estimating the immediate impact on water quality. A fixed volume of undisturbed bottom sediment from the dredge site is added to a fixed volume of composite receiving water (proposed disposal site water) at a ratio of 1:4, dredged material:receiving water. The sediment is allowed to settle; the supernatant is decanted, centrifuged, and filtered for clarification. The concentration of specific constituents in the clear supernatant (the standard elutriate) from the dredge material/receiving water mixture is compared with the concentration found in the original filtered receiving water. (Knapp-USGS)
W75-00242

PROCEEDINGS OF FOURHT ANNUAL SYMPOSIUM ON ENVIRONMENTAL POLLUTION, 4-5 APRIL 1973, SPONSORED BY THE AMERICAN ORDNANCE ASSOCIATION.
For primary bibliographic entry see Field 5D.
W75-00249

PREVENTION AND CONTROL OF HAZARDOUS MATERIAL SPILLS,
Environmental Protection Agency, Washington, D.C. Hazardous Material Spill Control Program.
P. R. Heitzenrater.
In: Proceedings of 4th Annual Symposikum on Environmental Pollution, April 4-5, 1973, Edgewood Arsenal, Aberdeen Proving Ground, Maryland: Edgewood Arsenal Special Publication EO-SP-73001 (EASP 1800-16), p 83-89, September 1973.

Descriptors: *Water pollution control, *Industrial wastes, Oil spills, Waste water(Pollution), Water pollution sources, Hazards, Poisons.
Identifiers: *Spills(Hazardous materials).

About 2,000 spills of hazardous material occur annually. Spills are expected to increase as a result of increased production, transport, storage, and transfer. The production of hazardous materials is expected to increase by 73% in the next 10 years. About 500 new chemicals are being developed and entered into commerce each year. Damages caused by hazardous material spills are both significant and diverse. Such pollution can destroy or limit marine life, ruin wildlife habitat, kill birds, limit or destroy the recreational uses of waters, contaminate water supplies, and create fire hazards. Major problems in the control of hazardous material spills in watercourses include the wide variation of substances, their reactivity problems, the persistence of materials, and the immediate and long-term effects. Materials spilled in watercourses may undergo physical and chemical changes and may combine with other materials which affect and increase their toxicity. Equipment and processes are under development for the prevention, control, and cleanup of spills. Although efforts must be directed toward prevention of spills, spills will continue to occure due to accidents, negligence, and natural disasters. It is therefore necessary to develop countermeasures to contain spills to prevent them from entering watercourses and to control and remove those that reach waters to minimize damage to the water ecosystem. The variability of the hazardous materials necessitates development of a wide range of countermeasures. (See also W75-00249) (Knapp-USGS)
W75-00254

OPTIMAL REAL-TIME CONTROL OF URBAN STORMWATER DRAINAGE,
Cornell Univ., Ithaca, N.Y. Dept. of Environmental Engineering.
For primary bibliographic entry see Field 6A.
W75-00261

LEACHING OF PICLORAM AND NITRATE IN TWO ALABAMA SOILS,
Auburn Univ., Agricultural Experiment Station.
For primary bibliographic entry see Field 5B.
W75-00263

COMBINED BUOYANCY AND BOUNDARY EFFECTS AND AERATION EFFECTS ON JET SPREADING,
Connecticut Univ., Storrs. Inst. of Water Resources.
E. K. Dabora, and R. L. Stoy.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 790, $3.25 in paper copy, $2.25 in microfiche. Completion Report, September 23, 1974. 4 p. OWRT A-050-CONN(2). 14-31-0001-3507.

Descriptors: Hydraulics, *Hydrodynamics, *Jets, *Buoyancy, *Submergence, Thermal pollution, Aquiculture, *Aeration.
Identifiers: *Jet spreading, Planar jets, Axisymmetric jets, Boundary effects, Forced vortex.

The effects of surface boundary, buoyancy and aeration on water jets were investigated both experimentally and analytically. For two-dimensional horizontally discharged jets with initial velocities up to 10 ft./sec., the flow field (trajectory and reattachment) point is dominated by the development of a forced vortex in the recirculation region. The most dominant factor seems to be the submergence ratio based on the exit slot height. Reynolds number and Froude number (up to 3) had little effect on the trajectory. For the heated jet the recirculation zone soon reaches the jet temperature and the jet behaves like an unheated one. Aeration provides increased buoyancy and therefore affects the reattachment location. In any case, the two-dimensional jet arrangement is suitable for providing containment of a pool of heated water above the jet trajectory which can be advantageous for either increased heat dissipation to the atmosphere or aquaculture. For the axisymmetric jets, aeration resulted in a decrease in the spread of the vertically discharged jet and an increase in the temperature decay of its centerline. For the horizontally discharged jet it resulted in a tendency for earlier reattachment and a delay in the temperature decay of the centerline. (de Lara-Connecticut)
W75-00265

TEMPORARY DETENTION OF STORM AND COMBINED SEWAGE IN NATURAL UNDERGROUND FORMATIONS,
For primary bibliographic entry see Field 5D.
W75-00274

NORTH FORK ALLUVIAL DECONTAMINATION PROJECT, HUBBARD CREEK RESERVOIR WATERSHED,
West Central Texas Municipal Water District, Abilene.
B. L. Jacob.
Copy available from GPO Sup Doc as EP1.23:660/2-74-019, $0.95; microfiche from NTIS, Springfield, Va 22161 as PB-236 798, $2.25. Environmental Protection Agency, Technology Series Report EPA-660/2-74-019, April 1974. 49 p, 8 fig, 9 tab, 4 ref. EPA Project 14020 EHW.

Descriptors: *Injection wells, *Brine disposal, *Groundwater, *Pollution abatement, Water pollution control, Aquifers, Reservoir evaporation, Secondary recovery(Oil), *Texas, Dewatering.
Identifiers: *Aquifer rehabilitation, Alluvial aquifer, Brazos River Basin(Tex), Brine-disposal pits, Oil-well plugging, *Hubbard Creek Reservoir Watershed(Tex).

A detailed demonstration project was performed to determine the effect that dewatering of a polluted alluvial aquifer and subsequent recharge by rainfall would have on the decontamination rate of the polluted alluvium. The alluvial deposits within the project area were polluted by years of brine water disposal from oil field operations into unlined earthen pits, secondary oil recovery operations, and abandoned and improperly plugged oil wells. Secondary benefits of the project were to determine the effect that removal of contaminated alluvial water would have on downstream water quality, and on the quality of water in a municipal water supply located downstream from the project site. Contaminated water withdrawn from the alluvium was disposed of in a deep disposal well having a depth of 5,700 feet. An evaluation of the project indicated that contaminated water from alluvial deposits can successfully be collected and disposed of. Decontamination of the alluvial deposits was determined to be at a very slow rate, and would take years to show significant improvement. No appreciable reduction in chlorides in the reservoir resulted from the three years operation of the project. (EPA)
W75-00275

ROLE OF PHOSPHORUS IN EUTROPHICATION,
National Environmental Research Center, Corvallis, Oreg.
For primary bibliographic entry see Field 5C.
W75-00276

ESTABLISHING MARKETS FOR WATER QUALITY,
Clemson Univ., Water Resources Research Inst.
A. H. Barnett, R. D. Shannon, and B. Yandle.
South Carolina Water Resources Research Institute, Clemson, Report No 44, June 1974. 81 p, 8 fig, 112 ref. S-038-SC.

Descriptors: *Resource allocation, *Water law, *Water rights, *Water quality, *Economic efficiency, Economics, Marginal costs, Marginal benefits, Riparian rights, Appropriative rights, Interstate compacts, Regulation, Water quality act, Rivers and Harbor Act, Ohio River discharge(Water).
Identifiers: Genossenschaffen, Property rights, Common lands, Manorial system, Enclosure movement.

The report is divided into two parts. Part One takes an historical perspective examining the circumstances under which markets developed for another natural resource--land. The accepted view is that the development of markets and the establishment of clearly defined private property rights tend to be parallel. These developments in England are described. The widely established manorial system with its open fields and common lands gave way to private property arrangements during the Enclosure Movements. A comparison is made of the enclosure movement and the pollution problem. Part Two is concerned with water quality in a modern setting. The institutions which have been developed to manage water quality are summarized. In addition, the work of economic theorists investigating various market-like approaches to allocating water quality are discussed and criticized. Finally a composite system for allocating water quality is developed utilizing elements of the market which might be applied in a real setting. Problems which must be dealt with by those who seek to use market devices are identified.
W75-00279

INTERNATIONAL PROTECTION OF MARINE LIFE FROM THE EFFECTS OF POLLUTION DUE TO LAND-RELATED ACTIVITIES,
R. L. Mullinax.
In: Sea Grant Publication UNC-SG-73-01, p 147-154, March 1973. 24 ref.

Descriptors: *International law, *Oceans, *Marine fisheries, *Water pollution effects, *Commercial fishing, Fishing, Water pollution sources, Water law, Health, Safety, Recreation, Aesthetics, Standards, Water quality control, Monitoring, Regulation, Economic aspects, Industrial wastes, International waters, Legal aspects, Appraisals, Environmental effects, Natural resources, Federal jurisdiction.
Identifiers: *International agreements, *Territorial waters.

International cooperation is needed to protect marine life. Marine pollution has been defined as the introduction of substances or energy into marine environments resulting in harm to living resources, hazards to human health, hindrance to fishing and other recreation, and the impairment of quality for use of sea water and reduction of amenities. No standards of water quality criteria have been established to determine the extent or effect of pollution on marine life. No effective international regulation of the seas will be possible until such standards are set and a global monitoring system is implemented. Every year eight billion dollars worth of sea life is taken from the oceans. Each year a smaller proportion of the ocean is available for fishing. This is due to many pollutants such as DDT, oil, mercury, and industrial wastes. In some areas all marine life is dead. In others it is too contaminated to eat. (Sperling-Florida)
W75-00283

PUBLIC WORKS FOR WATER AND POWER DEVELOPMENT AND ATOMIC ENERGY COMMISSION APPROPRIATION BILL, 1975, PARTS 3, 4, 5.
For primary bibliographic entry see Field 6E.
W75-00286

IDAHO ENVIRONMENTAL STATUS AND PROGRAM EVALUATION, 1972.
Environmental Protection Agency, Seattle, Wash. Region X.
For primary bibliographic entry see Field 6E.
W75-00292

THE POTOMAC: PUTTING THE PIECES TOGETHER.
Interstate Commission on the Potomac River Basin, Bethesda, Md.
For primary bibliographic entry see Field 6E.
W75-00295

PUBLIC RIGHTS IN MAINE WATERS,
Maine Univ., Arono. School of Law.
For primary bibliographic entry see Field 6E.
W75-00297

SOME OBSERVATIONS ABOUT THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972,
Hand, Arendall, Bedsole, Greaves and Johnston, Mobile, Ala.
D. F. Pierce.
Federation of Insurance Counsel Quarterly, Vol 24, p 41-46, Fall 1973. 17 ref.

Descriptors: *Federal Water Pollution Control Act, *Legislation, *Federal jurisdiction, *Water pollution control, *Civil law, Law enforcement, Governmental interrelations, Navigable waters, Effluents, Water pollution sources, Water quality, Environmental sanitation, Technology, Economic feasibility, Adjudication procedure, Adoption of practices, Administration, Water law, Water policy, Federal government.
Identifiers: *Standing(Legal), *Private interest groups, *Administrative regulations, *Licenses, *Notice.

The Federal Water Pollution Control Act (FWPCA) was amended in 1972. The law provides for sweeping changes in the development and administration of water pollution control. Three major objectives are included in the amendments: the utilization by industry of the best practicable control technology currently available before 1977; the control of pollutant discharges by the best available technology economically achievable by 1983; and the absolute elimination of pollutant discharge into navigable waters by 1985. FWPCA now provides for grants for research and planning to achieve specific goals for enforcement of limitations of effluent discharges and authorizes a licensing system for those discharging effluents. Environmental groups and individual citizens have been given statutory standing to litigate for the enforcement of these standards but without recovering damages. Civil penalties are provided for willful violation of enumerated sections of the Act. Any party commencing an action must give notice to the state and the alleged violator, 60 days prior to the action. Unless FWPCA is construed to distribute civil penalties to the private citizen the Act will remain the tool of regulatory and environmental groups only. (Dillingham-Florida)
W75-00300

STATE OF OHIO V. CALLAWAY, ET AL. (CITIZEN'S SUIT CHALLENGING CORPS OF ENGINEERS ACTION).
1 Pollution Control Guide, Vol 3, paragraph 15079, p 15554-15560, July 15, 1974. 6 ref.

Descriptors: *Federal Water Pollution Control Act, *Flood control, *Reservoirs, *Environmental effects, *Judicial decisions, Recreation, Land use, Dams, Environment, Ohio River, Control, Discharge(Water), Spillways, Projects, Ohio, Water quality standards, Impounded waters, Impoundments, Water supply, Economic feasibility, Condemnation, Regulation, Water resources development, Administration, Adoption of practices, Enforcement.
Identifiers: *Environmental impact statements, *Injunctive relief, *National Environmental Policy Act, *Declaratory judgments, Private interest groups.

Plaintiff State of Ohio initiated action in the United States District Court seeking declaratory, injunctive, and other appropriate relief to stop construction on two reservoir projects in the state. Plaintiff alleged that defendant Army Corps of Engineers, by beginning construction without filing adequate environmental impact statements, had violated the National Environmental Policy Act (NEPA). Motions were also filed by certain conservation groups and property owners, and the Ohio Contractor Association, seeking to intervene as plaintiffs and defendant respectively. The District Court, balancing the interests of the affected parties, granted only part of the requested injunctive relief. Also, that court denied all motions to intervene, either as a right or permissively. On appeal, Ohio contended that the District Court, having found non-compliance with NEPA, had no discretion to exercise and was, therefore, required to issue entirely the relief requested. The Court of Appeals disagreed with this contention. Regarding intervention, the Court of Appeals held that the Federal Water Pollution Control Act conferred on applicants the unconditional right to intervene. Accordingly, the decision of the District Court was affirmed in part, reversed in part, and remanded for further proceedings. (Chennault-Florida)
W75-00304

UNITED STATES, ET AL. V. RESERVE MINING CO., ET AL. (POLLUTION OF INTERSTATE OR NAVIGABLE WATERS).
1 Pollution Control Guide, Vol 3, paragraph 15080, p 15560-15598, July 15, 1974.

Descriptors: *Rivers and Harbors Act, *Water pollution, *Lake Superior, *Industrial wastes, *Judicial decisions, Abatement, Navigable waters, Wisconsin, Michigan, Minnesota, Economics, Economic feasibility, Environment, United States, Public health, Asbestos, Air pollution, Water quality standards, Pollutants, Turbidity, Effluents, Regulation, Federal Water Pollution Control Act, Enforcement, Environmental effects, Public benefits, Water pollution sources, Water resources development.
Identifiers: *Refuse Act, *Injunctive relief, Public trust doctrine, Private interest groups, Effluent limitations.

United States and intervening parties brought suit to enjoin defendant mining company from discharging asbestiform tailings into Lake Superior and amphibole particles into the air of the surrounding areas. Plaintiff asserted that the discharges were subject to abatement pursuant to the Federal Water Pollution Control Act (FWPCA); that they constituted interstate pollution and endangered the health and welfare of persons in the states of Michigan, Minnesota and Wisconsin; that they violated the Refuse Act; and that these discharges constituted nuisances subject to abatement under federal common law. Plaintiffs requested immediate curtailment of the discharges and such other relief as the court deemed just and proper. Defendant counterclaimed seeking money damages on the contentions that (1) a limitation or termination of its operations constituted a taking without just compensation under the Constitution, and that (2) such action constituted an impairment of contractual rights contrary to the Constitution. The United States District Court found the allegations of plaintiffs substantiated. After considering the public interest, the equities, and the physical and economic feasibility of securing abatement involved, the court, pursuant to FWPCA, ordered an immediate abatement of the discharges. (Chennault-Florida)
W75-00305

POLLUTION CONTROL STRATEGIES.
1 Pollution Control Guide, Vol 1, paragraph 400-416, p 423-430, 1973.

Descriptors: *Water pollution control, *Environmental sanitation, *Regulation, *Economic aspects, Planning, Toxicity, Environmental effects, Cost-benefit analysis, Industrial wastes, Legal aspects, Waste water disposal, Water pollution sources, Conservation, Water pollution effects, Legal aspects, Safety, Economic aspects, Economic impact, Adoption of practices.
Identifiers: *Effluent limitations, *Effluent charges, *Administrative regulations.

The most common strategy to deal with environmental problems presently being used is to set and enforce environmental standards. Standards of quality are established to meet the uses and are based on available scientific evidence of the toxicity, persistence, and other effects of pollutants which interfere with the designated uses. Another promising possibility is to levy effluent charges for dumping of waste materials into the environment. A well constructed charge system tied to the amount and type of pollutants would quickly curb waste discharges because it would significantly change the basic costs facing individual polluters. Pollution charges would provide a strong abatement incentive and would tie environmental costs to the processes that generate the pollution. Manufacturing processes would be changed to improve internal plant management of wastes, and more reliance would be placed on recycling and recovery to reduce waste discharge. (Sperling-Florida)
W75-00306

TERMS AND CONDITIONS OF PERMITS -- NPDES.
1 Pollution Control Guide, Vol 1, paragraph 1527-1537, p 1527-1542, 1973.

Descriptors: *Water pollution control, *Federal government, *Discharge(Water), *Administration, *Regulation, Permits, Administrative agencies, Water quality standards, Federal Water Pollution Control Act, Water Quality Act, Governmental interrelations, Water law, Legal aspects, Water quality, Water quality control, Effluents, Nonstructural alternatives, Control, Law enforcement, Monitoring.
Identifiers: *Administrative regulations, *Effluent limitations, *Licenses, FWPCA Amendments of 1972.

Presented are the Environmental Protection Agency regulations governing the terms and conditions applicable to discharge permits issued under the National Pollutant Discharge Elimination System (NPDES). Included are provisions pertaining to specific prohibitions, general permit conditions, schedules of compliance, effluent limitations in permits, monitoring, recording, and reporting requirements, and special categories of permits. Set forth are the specific conditions under which a new permit must be obtained, and the circumstances under which a permit may be revoked or modified. Disposal into wells and municipal discharges comprise the special categories of permits and applications for these permits are subject to special criteria of evaluation. Detailed monitoring, recording, and reporting requirements are delineated. Failure to comply with these or any other conditions of a permit constitutes a violation of the permit and subjects the permittee to civil or criminal sanction. (Deckert-Florida)
W75-00307

ENFORCEMENT OF DISCHARGE VIOLATIONS.
1 Pollution Control Guide, Vol 1, paragraph 1551-1579, p 1551-1566, 1973.

Descriptors: *Law enforcement, *Water pollution control, *Federal government, *Discharge(Water), *Administrative agencies, Regulation, Legislation, Water quality standards, Federal Water Pollution Control Act, Water Quality Act, Water quality, Water law, Governmental interrelations, Water quality control, Non-structural alternatives, Effluents, Water pollution sources, Water pollution control, Legal aspects, Penalties(Legal), Administration, Inter-agency cooperation.
Identifiers: *Administrative regulations, *FWPCA Amendments of 1972, *Immunity(Legal aspects), *Environmental policy.

Enforcement provisions of the Federal Water Pollution Control Act regarding the discovery of violations of the Act and the remedial and punitive actions which may be taken by the Environmental Protection Agency to enforce the Act are presented. The enforcement authority of the EPA is designed to achieve compliance with all effluent limitations and prohibitions, state water quality standards and information requirements, regardless of whether the discharger or other person must obtain a permit. EPA's authority also encompasses enforcement of the conditions of permits issued under the National Pollutant Discharge Elimination System. Because EPA is expected to rely heavily on the enforcement actions of the states, the enforcement provisions are supplemental to those of the states. EPA is authorized to enter, inspect, and monitor any source as well as act on citizen complaints. Employees who furnish information concerning alleged violations are protected from retaliatory firing or discrimination. The provisions set forth a wide range of alternatives available to EPA where an actual or threatened violation occurs. These include revocation of permits, orders of compliance, injunctive relief, and stiff criminal penalties. (Deckert-Florida)
W75-00308

PROPOSED REGULATIONS--AQUACULTURE PROJECTS.
1 Pollution Control Guide, Vol 3, paragraph 10601, p 11251-11260, 1974.

Descriptors: *Aquiculture, *Water permits, *Federal Water Pollution Control Act, *Navigable waters, *Water quality standards, Discharge(Water), Water law, Water quality control, Water pollution, Regulation, Water quality, Federal government, Governmental interrelations, Legislation, Water pollution control, Water pollution sources, Effluents, Pollutants, Water policy, Water resources development, Water Quality Act, Administrative agencies, Non-structural alternatives, Permits.
Identifiers: *Administrative regulations, *Non-point sources(Pollution), *FWPCA Amendments of 1972, *Effluent limitations, *Licenses.

Regulations are proposed by the Environmental Protection Agency to implement section 318 of the Federal Water Pollution Control Act as amended. This section permits, under controlled conditions, discharges of pollutants associated with an approved aquaculture project that is under federal or state supervision. The proposed regulations provide that discharges of pollutants inside a designated project area may exceed other standards, but such discharges must not result in the addition of pollutants to navigable waters outside the project area in quantities that would violate other provisions of the Act if the project area were itself a 'point source' as defined in section 502(14) of the Act. An approved project is one which has been issued a permit by the EPA pursuant to procedures established in the regulations, and Regional Administrators have authority to revoke such permits. The regulations provide an opportunity for public hearing prior to issuance of a permit, but one is not required if no member of the public requests one. However, state certifying agencies must certify that additions of pollutants to navigable waters will not exceed effluent guidelines established under the Act before a permit may be issued. (Deckert-Florida)
W75-00309

NATURAL RESOURCES DEFENSE COUNCIL, INC. V. TRAIN (ADMINISTRATIVE DISCRETION--EFFLUENT STANDARDS).
1 Pollution Control Guide, Vol 3, paragraph 15071, p 15514-15515, June 10, 1974. 5 ref.

Descriptors: *Federal Water Pollution Control Act, *Effluents, *Water pollution control, *Water pollution, *Judicial decisions, Standards, Abatement, Waters, Discharge(Water), Government, Regulation, Environment, Legislation, Pollutants, Administrative decisions, Administrative agencies, Federal government, Administration, Adoption of practices, Environmental effects, Water quality standards, Water quality, Water quality control, Water resources development, Toxins.
Identifiers: Effluent limitation, Administrative regulations.

Plaintiffs Natural Resources Defense Council brought action to invalidate the criteria proposed by defendant administrator of the Environmental Protection Agency (EPA). Plaintiff contends that the EPA abused its discretion in selecting those substances designated for immediate development of effluent standards. Also, plaintiffs sought an order compelling defendant to amend his selection criteria and to include additional substances in his initial list of toxic pollutants for which effluent standards would be promulgated. Plaintiffs contended that the criteria used to select the toxic substances to appear on the first list issued by the Agency were inadequate. The United States District Court found the criteria employed to be both logical and relevant. Congress had clearly vested defendant with the discretion necessary to perform his duties under the Federal Water Pollution Control Act. There was no showing that he had abused that discretion or that he had exercised it except in a lawful and logical manner. Therefore, the court refused to interject itself into what it considered an on-going and orderly administrative process or to substitute its judgment for that of the administrator. Accordingly, the court ordered the complaint dismissed in its entirety. (Chennault-Florida)
W75-00310

COLORADO PUBLIC INTEREST RESEARCH GROUP, INC. V. TRAIN (NUCLEAR POWER PLANTS--RADIOACTIVE MATERIALS DISCHARGE).
1 Pollution Control Guide, Vol 3, paragraph 15072, p 15516-15519, June 25, 1974.

Descriptors: *Federal Water Pollution Control Act, *Nuclear powerplants, *Water pollution control, *Discharges(Water), *Judicial decisions, *Radioactive waste disposal, Legislation, Effluents, Regulation, Facilities, Control, Administrative decisions, Government, Federal government, Protection, Water pollution, Pollutants, Colorado, Waste disposal, Waste water, Water pollution sources, Radioactive wastes, Administrative agencies, Inter-agency cooperation, Environmental effects, Water policy.
Identifiers: *Atomic Energy Act, Private interest groups.

Plaintiffs Colorado Public Interest Research Group challenged the accord worked out between the Atomic Energy Commission (AEC) and the Environmental Protection Agency (EPA) regarding the interaction of the Federal Water Pollution Control Act (FWPCA) and the Atomic Energy Act (AEA). Plaintiffs contended that the EPA had jurisdiction to regulate the discharge of 'byproduct', 'source', and 'special' nuclear wastes from nuclear power plants. Contrarily, defendants Administrator of the EPA and EPA contended that the regulation of the discharge of these particular materials was under the exclusive jurisdiction of the AEC. The FWPCA gives the EPA power to regulate the discharge of some radioactive 'pollutants'. The United States District Court, upon reviewing the legislative history of the two acts, found that the AEC, indeed, had exclusive jurisdiction over effluents from 'byproduct', 'source' and 'special' nuclear materials. It was apparent, the court said, that Congress did not intend to give the EPA jurisdiction over these materials. The court, therefore, granted motion of defendants for summary judgment and denied request of plaintiffs for attorney fees. (Chennault-Florida)
W75-00311

SEASONAL VARIATIONS AND DISTRIBUTION OF DISSOLVED IRON IN AN AQUIFER,
Geological Survey of Sweden, Stockholm.
For primary bibliographic entry see Field 5B.
W75-00336

BILL TO ESTABLISH LAND USE POLICY.
House, Washington, D.C.
For primary bibliographic entry see Field 6E.
W75-00365

UPPER SUWANNEE RIVER, EVALUATION OF A PROPOSED DRI AS AN AREA OF CRITICAL STATE CONCERN, COLUMBIA AND HAMILTON COUNTIES, FLORIDA.
Florida Div. of State Planning, Tallahassee. Bureau of Land Planning.
For primary bibliographic entry see Field 4A.
W75-00372

REPORT OF PROCEEDINGS CONCERNING THE RECLASSIFICATION OF VARIOUS STREAMS IN NORTH CAROLINA, SECTION 1, HICKORY PUBLIC HEARING JUNE 29, 1972.
North Carolina Dept. of Natural and Economic Resources, Raleigh. Office of Water and Air Resources.
For primary bibliographic entry see Field 4A.
W75-00373

APPLYING A WATER QUALITY MODEL TO POLLUTION MANAGEMENT: D.O.--B.O.D. IN NARRAGANSETT BAY,
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
For primary bibliographic entry see Field 5B.
W75-00382

BIOLOGY-CHEMISTRY PROGRAM FOR THE INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES,
National Environmental Research Center, Corvallis, Oreg. Canada Centre for Inland Waters, Burlington (Ontario).; and National Oceanic and Atmospheric Administration, Ann Arbor, Mich. Great Lakes Environmental Lab.
For primary bibliographic entry see Field 2H.
W75-00402

THE IFYGL FISHERIES STUDY,
Department of Lands and Forests, Picton (Ontario). Genora Fisheries Station; and Bureau of Sport Fisheries and Wildlife, Ann Arbor, Mich.
For primary bibliographic entry see Field 2H.
W75-00403

DEVELOPMENT OF HERMAPHRODITE BREAKWATER UNITS UTILIZING HYDROFOILS IN SPECIFIC ARRANGEMENTS,
Delaware Univ., Newark. Dept. of Civil Engineering.

For primary bibliographic entry see Field 8B.
W75-00411

THE FUNGAL FLORA OF WATERHYACINTH IN FLORIDA,
Florida Univ., Gainesville. Dept. of Plant Pathology.
K. E. Conway, T. E. Freeman, and R. Charudattan.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 783, $3.25 in paper copy, $2.25 in microfiche. Florida Water Resources Research Center, Gainesville, Publication No 30, September 1974. 11 p, 30 fig, 19 ref. OWRT A-027-FLA(3), 14-31-0001-4009.

Descriptors: *Florida, *Water hyacinth, *Aquatic fungi, Biocontrol, Fungicides, Pathogenic fungi, Aquatic weed control.

Research was initiated to survey, isolate, identify, test, and catalogue all fungi associated with waterhyacinths. The ultimate goal is to find organisms that can be used as biological controls to limit the growth rate or destroy the waterhyacinth. An understanding of the role played by fungi in the decline and death of waterhyacinth has been aided by stydying both saprophytes and parasites. This report includes 30 species of fungi. The location, date of collection, pathogenicity, and references of each isolate is provided. A more effective biocontrol should be possible by knowing what environmental factors favor the presence of fungal pathogens on the waterhyacinth. (Morgan-Florida)
W75-00423

A SYSTEMATIC EVALUATION OF ENVIRONMENTAL PERCEPTIONS, OPTIMUM PREFERENCES; AND TRADE-OFF VALUES IN WATER RESOURCE ANALYSIS,
Oregon State Univ., Corvallis. Dept. of Agricultural Economics.
For primary bibliographic entry see Field 6B.
W75-00425

WATER POLLUTION CONTROL IN NEW JERSEY,
Rutgers the State Univ., New Brunswick, N. J. Bureau of Government Research.
P. H. Burch.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 924 $7.25 in paper copy, $2.25 in microfiche. March 1973. 202 p, 1 map, 3 tab, 357 ref, 2 append. OWRT A-016-NJ(2).

Descriptors: *New Jersey, *Water quality control, *Water Quality Act, Interstate Commissions, Economics, Legal aspects, Water pollution, Abatement, Non-structural alternatives, Water quality standards.

The focus of this analysis is on both the statutory framework for water pollution control and on the administrative actions taken to both establish water quality goals and to secure local governmental and industrial compliance with the prescribed objectives. Attention is given to the water pollution control policies adopted by the interstate Sanitation Commission and the Delaware River Basin Commission. The role of the federal government is also described in detail. This study is from a governmental standpoint rather than a technical or scientific one. Related economic and environmental questions are treated to the extent they bear on governmental aspects. The major theme is on how New Jersey has moved to improve its position in water pollution control. Included is a list of publications, conference proceedings, study kits and article reprints which can be obtained. Also included is a summary of the Department of the Interior's guidelines established to help evaluate state water quality criteria and enforcement programs proposed in conjunction with the Federal Water Quality Act of 1965. (Sears-Florida)
W75-00429

EFFECTS OF AN OIL SPILL REMOVER ON BEACH MEIOFAUNA,
Queen's Univ., Belfast (Northern Ireland). Dept. of Zoology; and Queen's Univ., Belfast (Northern Ireland). Marine Biology Station.
For primary bibliographic entry see Field 5C.
W75-00449

SMITH V CITY OF WOODSTOCK (ACTION BY RIPARIAN OWNERS TO ENJOIN OPERATION OF UPSTREAM SEWAGE TREATMENT PLANT).
For primary bibliographic entry see Field 6E.
W75-00460

HODGE V CITY OF MARMADUKE (ACTION TO ENJOIN CITY FROM DISCHARGING INTO PRIVATE DRAINAGE DITCH).
For primary bibliographic entry see Field 6E.
W75-00463

BUCKS COUNTY BOARD OF COMMISSIONERS V COMMONWEALTH OF PENNSYLVANIA PUBLIC UTILITIES COMMISSION (APPEAL FROM PUBLIC UTILITIES COMMISSION ORDERS).
For primary bibliographic entry see Field 6E.
W75-00465

THE CHEMEHUEVI TRIBE OF INDIANS V FEDERAL POWER COMMISSION (LICENSING JURISDICTION OF FEDERAL POWER COMMISSION INVOLVING EFFECT ON NAVIGABILITY).
For primary bibliographic entry see Field 6E.
W75-00468

AWWA MANAGEMENT PROGRAM DEVELOPMENTS,
Kennedy Engineers, San Francisco, Calif.
For primary bibliographic entry see Field 6B.
W75-00469

WATER POLLUTION: GOVERNMENTAL ACTIVITIES IN BROWARD COUNTY,
Florida Atlantic Univ., Boca Raton.
N. S. Davis.
Florida Planning and Development, Vol 23, No 3, p 1-5, March 1972.

Descriptors: *Water pollution control, *Industrial waste, *Oily wastes, *Government finance, *Waste treatment, Electric power plants, Administrative agencies, Coordination, Federal government, State governments, Local governments, Sewage effluents, Legal aspects, Adoption of practices, Waste treatment facilities, *Florida. Identifiers: Administrative regulations, Coastal waters, State policy, Broward County(Fla).

Governmental activities in water pollution control cannot be physically or legally confined to the political boundaries of the county. The Interior and coastal waters of Broward County, Florida, are polluted from nine sources: dead vegetation, utility and treatment plant effluents, industrial wastes, laundries, leaching of soils, marine toilets, oil from boats, power plants, and septic tanks. Federal, state and local governments all have legal authority in the area of water pollution control. Broward County has received only one federal grant for construction of a sewage treatment facility. Other federal assistance has been provided for a joint water sampling project. The Florida Department of Air and Water Pollution Control (DAWPC) assists Broward County primarily in a supervisory manner. However, DAWPC's 1971-1972 appropriation included $25 million dollars for grants to be given to counties with pollution abatement programs. Broward County is currently building a large regional sewage treatment plant. (Sperling-Florida)
W75-00471

THE PUBLIC TRUST: A NEW CHARTER OF ENVIRONMENTAL RIGHTS,
For primary bibliographic entry see Field 6G.
W75-00472

DRBC (DELAWARE RIVER BASIN COMMISSION) ENDS A DECADE OF GROWTH.
For primary bibliographic entry see Field 6E.
W75-00475

THE HYDROGRAPHY OF ELKHORN SLOUGH, A SHALLOW CALIFORNIA COASTAL EMBAYMENT,
Moss Landing Marine Lab., Calif.
For primary bibliographic entry see Field 2L.
W75-00497

THE NEW ENGLAND WATER-UTILITY STORY,
Metcalf and Eddy, Inc., Boston, Mass.
E. B. Cobb.
Journal of American Water Works Association, Vol 66, No 4, p 207-220, April, 1974. 9 tab, 10 ref.

Descriptors: *Water utilization, *Water works, *New England, *Water supply, Connecticut, Maine, New Hampshire, Vermont, Rhode Island, Massachusetts, Water sources, Water yield, Northeast U.S., Watershed management, Watersheds(Basins), Water rates, Water distribution, Water conveyance, Water control, Water resources, Water resources development, Water policy, Water demand, Water conservation, Water consumption, Municipal water, Surface water availability, Surface groundwater relationships. Identifiers: *Water utility associations, *Water utility, Groundwater utilization, Water use.

The history and development of community water utilities in each of the New England states (Maine, Vermont, New Hampshire, Connecticut, and Rhode Island) is presented together with information about supply sources, treatment, and outstanding systems in each state. Maine was one of the first two states to incorporate regulation of publicly-owned utilities such as water systems into its general laws. Maine Public Utilities Commission has jurisdiction over all water utilities and must approve rates charged for all classes of service. In Connecticut, however, the first town was established in 1633, but two centuries later community water-supply finally appeared. In Vermont, filtration facilities are not yet part of most water systems since protected watersheds and large-intake reservoirs produce water acceptable and safe when disinfected by chlorination. The first municipal water system in New Hampshire was developed in 1852 when Nashua residents petitioned the legislature for a water company; some of the original equipment is still in use today. In Massachusetts, conditions have led to the development of surface-water supplies for larger towns angroundwater sources for smaller towns. Rhode Island has fifty water systems which supplied 92% of the population during 1973. Development of Providence's water supply system finally occurred in 1870 after the idea was finally approved by the voters. (Grden--North Carolina)
W75-00538

6. WATER RESOURCES PLANNING

6A. Techniques Of Planning

A STUDY OF THE EFFECTIVENESS OF WATER RESOURCES PLANNING GROUPS: A FINAL REPORT,
Utah State Univ., Logan. Center for Water Resources Research.
D. H. Hoggan, J. Mulder, S. J. Taylor, D. E. Oaks, and B. Somers.
Available from the National Technical Information Service, Springfield, Va. 22161 as PB-236 630 $9.50 in paper copy, $2.25 in microfiche. Utah Water Research Laboratory, Logan, Report PRWG110-1, March 1974. 344 p, 27 fig, 70 tab, 5 append. OWRT C-2089(No. 3671) (1).

Descriptors: *Water resources development, *Planning, *Organizations, Water policy, Model studies, *Regional analysis, *River basin development, Decision making, *Simulation analysis.
Identifiers: Susquehanna River Basin Comprehensive Study, Willamette River Basin Comprehensive Study, River basin planning studies, Policy decision-making models.

Information and recommendations were developed pertaining to the organization of regional and river basin water planning studies useful to river basin commissions and others responsible for such studied. The approach includes four basic components: (1) conceptualization of a planning model, based on an analysis of planning theory and organizational literature, (2) analysis and review of historical trends in water resources planning, (3) examination and comparative evaluation of 15 river basin planning studies, and (4) case studies of two planning efforts selected from the 15 examined in order to perform a more detailed analysis and to gain information about the informal aspects of the planning processes that took place. In connection with the formulation of the planning model, a substantial amount of research effort was committed to the development of a computer simulation of decision-making in the planning or policy formulation process. This programmed simulation is designed to be a useful planning tool for gaining insights into the interrelationships among objectives, alternative courses of action, and political feasibility. A description of the simulation model and an analysis of its application to the Willamette River Basin Comprehensive Study are presented.
W75-00001

PROJECT SELECTION BASED ON BENEFITS AND COSTS,
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia). Div. of Building Research.
A. R. Toakley, and J. F. Brotchie.
Journal of the Construction Division, American Society of Civil Engineers, Vol 98, No CO2, Proceedings paper No. 9163, p 149-160, September 1972. 5 fig, 2 tab, 31 equ, 8 ref.

Descriptors: *Cost-benefit analysis, *Costs, *Financing, *Projects, Programs, Optimization, Construction, Equations, Mathematical models, Systems analysis.
Identifiers: Nonlinear programming, Calculus.

When funds are to be allocated for a program of works and finance is limited, there is a problem in choosing the most effective program. This general type of problem can occur, e.g., in the determination of works projects in the public sector, or in the selection of jobs by a developer or construction company. If the cost-benefit relationship for each project can be quantified, then for a given allocation of funds, the projects can be selected on the basis of a maximum ratio of benefits to costs, or maximum total difference between benefits and costs. Determination of the optimum program involves only a simple arithmetic procedure where benefits are proportional to cost. Problems involving either a continuous nonlinear or discrete cost-benefit relationship, or both, can be stated and solved as mathematical programming problems. Alternatively, a technique involving the use of Lagrangian multipliers can be used to solve certain classes of nonlinear problem. (Bell-Cornell)
W75-00018

THE DEMAND FOR AGRICULTURAL WATER IN UTAH,
Utah State Univ., Logan.
M. H. Anderson, J. C. Andersen, J. E. Keith, and C. G. Clyde.
PRWG100-4, Utah Water Research Laboratory, College of Engineering, Utah State University, Logan, Utah, September 1973. 52 p, 6 fig, 9 tab, 43 ref, 8 append. Army DACW31-71-C-0063.

Descriptors: *Utah, *Water resources development, *Economics, *Water demand, *Agriculture, *Irrigation water, *Linear programming, Regions, Estimating, Optimization, Water shortage, Water quantity, Water transfer, Drainage districts, Irrigated land, Irrigable land, Water allocation(Policy), Decision making, Constraints, Hydrologic aspects, Mathematical models, Systems analysis.
Identifiers: *Demand curve, Shadow price, Net benefit, Information.

Economic information is provided which is necessary for sound decisions in the development and use of Utah's water resources with respect to agriculture. Utah has been divided into ten drainage regions (hydrologic subregions), and the presently irrigated and potentially irrigable land according to land class were estimated for each county or portion of a county within each of the regions. Water use factors, crop rotation constraints, costs of production, yields, product prices, and costs of bringing new land into production were also estimated. These values were then used in a linear programming model to estimate a normalized demand (marginal value product) schedule for water to be used in agricultural production with each region. The amount of water made available to the production model for each hydrologic subregion was varied so that the model created a shadow price (marginal value product) at each level. These were then combined to estimate the relationship between the quantity of water and its economic value (a demand schedule). More production could be obtained from the presently irrigated land through the use of more water and/or the transfer of water from lands with low productivity to high quality land. (Bell-Cornell)
W75-00019

TOMORROWS'S WATERWAYS,
Office of the Chief of Engineers (Army), Washington, D.C. Systems Analysis Applications Branch.
D. A. Koch.
Water Spectrum, Vol 6, No 2, p 1-7, 1974.

Descriptors: *Systems analysis, *Navigation, *Scheduling, *Projects, *Simulation analysis, *Locks, *Inland waterways, Construction, Design, Evaluation, Timing, Costs, Benefits, Planning, Computers, Dams, Mississippi River.
Identifiers: Improvement programs, Towing, Congestion.

As well as being used for the design and evaluation of a recommended navigation improvement, systems analysis should also be utilized in scheduling the resultant construction. Conditions which demonstrate this fact are discussed in detail. The lack of a systematic methodology has resulted in building to either over or under capacity. Use of a systems approach would yield direct benefits to shippers and tow operators in the form of better scheduling of tow movements and more efficient utilization of towing equipment. With a reduction in overall trip delays, the shipper and consumer can benefit from the economics of lowcost water transportation. Described is the Corps of engineers use of computer simulation to model a lock traffic congestion problem on the Mississippi River. The Inland Navigation System Analysis (INSA) program is in the process of developing procedures to analyze projects on a system-wide basis, including a mathematical simulation model. INSA plans to provide tools to design and schedule the construction of improvements to the entire inland waterway network of channels, dams and locks as truly integrated system. (Bell-Cornell)
W75-00020

COORDINATED OPERATION OF CENTRAL VALLEY AND STATE WATER PROJECTS,
California State Dept. of Water Resources, Sacramento. Div. of Operations and Maintenance.
W. R. Madsen, and D. G. Coleman.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper No 10887, p 1399-1410, October 1974. 1 fig, 4 tab.

Descriptors: *Water management(Applied), *Multiple-purpose projects, *River basins, *Reservoirs, *Operations, *Dams, *Hydroelectric power, *Governments, Flood control, Canals, Irrigation, Reclamation, Coordination, Water resources.
Identifiers: Human relations, Public relations.

Water Resource projects within the same watershed basin must be operated in coordination with each other to assure the most efficient utilization of the available water supply. Examined is the coordinated operation, and some of the problems involved, between two multipurpose projects within the Central Valley Basin of California. These two projects, the Bureau of Reclamation's Central Valley Project and the California Department of Water Resources' State Water Project, are co-operated through a formal written agreement. As multiple-purpose projects, each has similar objectives which include irrigation, flood control, power production, water quality control, navigation, fisheries, wildlife protection, and recreation. With the growing demands and changing priorities for water, it is not only paramount that today's water manager have the technical expertise but also an understanding of human relations. (Bell-Cornell)
W75-00023

MANAGING SYSTEM OPERATIONS---CENTRAL VALLEY PROJECT,
Bureau of Reclamation, Sacramento, Calif. Water and Power Control Div.
D. M. Fults, and L. F. Hancock.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper no 10886, p 1419-1427, October 1974. 3 fig, 6 ref.

Descriptors: *Water management(Applied), *Multiple-purpose projects, *Government, *Hydraulics, *Automation, *Water supply, Operations, Decision making, Computers, Scheduling, River basins, Watersheds(Basins), Operations research, Data collections, Systems analysis, Mathematical models, California.
Identifiers: Technical aspects, Human development, Centralized control, Systems engineering.

The management of the Central Valley Project in California is described. Organizational changes are analyzed and summarized. The management philosophy in the project's operations office is attuned to the complexities arising from technical and human involvement. Technical aspects of decision making are reviewed. The management of project operations is based upon organizational development theory. It is illustrated that there is more to the successful implementation of contem-

porary management of river basin operations than the design and use of mathematical models. The complete management system must account for the quality of the data and the goals and expertise of the people responsible for collecting and using the data. The development of modern river basin management must be concerned with development of people as well as the creation of an efficient operating mechanism. (Bell-Cornell)
W75-00024

MANAGING MULTIRIVER SYSTEM---PAST, PRESENT, AND FUTURE,
Bureau of Reclamation, Sacramento, Calif. Mid-Pacific Regional Office.
R. G. Pollan.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper No 10873, p 1429-1435, October 1974.

Descriptors: *California, *History, *Water management, *Planning, Hydroelectric power, *Water consumption(Except consumptive use), Water distribution(Applied).

Factors affecting water resource planning are changing rapidly. In response to this, the Bureau of Reclamation has developed a total water management planning study in the Central Valley, California, an area where many water projects and facilities have been constructed and operated to meet needs not entirely compatible with today's requirements. The planning approach is an attempt to blend full consideration of environmental and social factors with that of all alternative actions that might be reasonably possible for future project operation and development. Such a process entails the exploration of several specific study items or alternatives for study related to various aspects of water resource development, some relating to the Central Valley Project specifically, others being of wider interest. Forty-three alternatives for study have been identified. These include alternative ways of: (1) increasing the usable water quantity; (2) improving and protecting the water quality; (3) reallocating water supplied for higher or better uses; (4) reducing water losses and uses; and (5) enhancing water related activities. (Bell-Cornell)
W75-00025

TIMING AND SIZING OF COMPLEX WATER RESOURCE SYSTEMS,
California Univ., Los Angeles. Dept. of Systems Engineering.
L. Becker, and W. W-G. Yeh.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper No 10883, p 1457-1470, October 1974. 2 fig, 3 tab, 6 equ, 12 ref.

Descriptors: *Multiple-purpose reservoirs, *Timing, *Sequencing, *Hydraulics, *Linear programming, *Dynamic programming, Optimization, Projects, Water resources development, Methodology, Computers, Constraints, Powerplants, Inflows, Mathematical models, Systems analysis, Equations, Algorithms, California.
Identifiers: *Economic analysis, *Sizing, *Preinvestment planning, Cost minimization, Generating plants, Procedures, Computational techniques, Eel River(Cal).

Presented is a procedure wherein the problem of computer memory and time requirements concomitant to the sizing of multiple-facility, mulitple-purpose water resource systems and to the calculation of their conjunctive outputs of firm power and water is effectively alleviated, thus permitting an efficient solution of the preinvestment planning problem. The procedure incorporates an iterated linear programming technique for optimization of the system operation and facility sizing, and a dynamic programming formulation for the determination of the optimal sequencing and timing. This method is characterized by an efficient linearization of the system relationships (to any accuracy desired), reservoir and generating plant sizing against an extended period of subnormal reservoir inflows typical of the stream critical periods, low computer time requirements, and high flexibility in testing the effects of added or changed system constraints. Technique description centers about, but is not limited to, a situation where future water and power demands up to a time horizon are specified so that the overall optimization criterion is to minimize the present worth of total project costs. The LP-DP approach makes use of the best features of both algorithms. The procedure is applied to a system associated with the Eel River Project, Northern California. (Bell-Cornell)
W75-00026

METAGAME ANALYSIS OF WATER RESOURCES CONFLICTS,
Waterloo Univ., (Ontario). Dept. of Civil Engineering.
K. W. Hipel, R. K. Ragade, and T. E. Unny.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper No 10861, p 1437-1455, October 1974. 3 fig, 15 tab, 9 equ, 4 ref.

Descriptors: *Operations research, *Water resources, *Management, *Hydraulics, *Political aspects, Algorithms, Dams, Rivers, Flood control, Equations, Economics, Optimization, Projects, Decision making, Canada, United States, Constraints, City planning, Analysis, Mathematical models.
Identifiers: *Game theory, *Digital techniques, *Metagame analysis, *Integer programming, *Benefit maximization, Dam allocation, Computer programming, Stability analysis, Policies, Conflict.

Presented is metagame analysis, an operations research technique that reconstructs classical game theory on a nonquantitative basis in order to analyze real world political problems. Since water management problems ultimately require a political decision, the metagame analysis algorithm can be used to solve water resources conflicts. Herein, metagame analysis is illustrated by application to a simple water resources problem. This is followed by a general algorithm for application of metagame analysis in conflict situations. Then a hypothetical dam allocation problem is formulated using integer programming to show how output from a quantitative operations research method may be used as input to the political analysis. The solution to the problem is not only technically and economically feasible, but also politically feasible. (Bell-Cornell)
W75-00027

OPTIMUM WATER LEVEL REGULATION OF LAKE BALATON, HUNGARY,
Water Resources Center, Budapest (Hungary).
For primary bibliographic entry see Field 4A.
W75-00088

AN OPTIMIZATION MODEL FOR THE OPERATION OF LAKE KINNERET,
Tahal Consulting Engineers Ltd., Tel-Aviv (Israel).
For primary bibliographic entry see Field 4A.
W75-00089

WATER MANAGEMENT ON LAKE VELENCE WITH SPECIAL REFERENCE TO OPTIMUM WATER LEVEL,
Water Resources Center, Budapest (Hungary).
I. Bogardi, and K. Koris.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 447-451. 2 fig, 8 ref.

Descriptors: *Recreation, *Lakes, *Water management(Applied), Water resources, *Water levels, Aquatic life, Mathematical models, Reservoir operation, Optimization, Systems analysis.
Identifiers: *Hungary(Lake Velence), Linear decision rule.

Lake Velence, the third largest lake in Hungary increasingly serves the growing needs of recreation. However, the water level changes to such an extent that both recreation and the biological life of the lake are disturbed, causing economic losses. To diminish water level fluctuations two reservoirs were constructed on the catchment area of the lake, and in this way excess spring high levels can be lowered and summer low ones can be raised. The mathematical model presented referred to the optimum operation of the system, consisting of the two reservoirs and the lake, in order to ensure favorable water levels for recreation. Optimum operational schedules were determined by the linear decision rule. The objective function aimed at minimizing the expected value of the sum of squares (weighted by positive numbers) of monthly deviations from the required level, that is, the minimization of expected losses caused by the deviations. Chance constraint programming was used because the guarantee of maximum and minimum lake levels with given probabilities, and maximum and minimum reservoir and lake outflows were also considered. (See also W75-00029) (Singh-ISWS)
W75-00090

PLANNING A WATER RESOURCES SYSTEM WITH MULTI-PURPOSE RESERVOIRS BY BREAKING DOWN THE SYSTEM ACCORDING TO ITS VARIOUS FUNCTIONS,
Institut za Vodoprivredu Jaroslav Cerni, Belgrade (Yugoslavia).
B. Djordjevic, and S. Opricovic.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publication No 109, p 452-458, 1973. 2 fig, 1 tab, 4 ref.

Descriptors: Hydraulics, *Optimization, *Water management(Applied), *Synthesis, Optimum development plans, Systems analysis, Lakes, Reservoirs, Planning, Hydrology, *Multiple-purpose reservoirs.
Identifiers: Multiple-purpose planning.

Systems analysis and optimization methods were utilized in planning a complex system equipped with multi-purpose reservoirs. Comples system properties were summarized and illustrated with a two reservoir project example. The complex system was broken down into two sub-systems; one for water utilization and another for flood control. They were optimized separately. The analysis was finalized with the synthesis of an aggregated system. (See also W75-00029) (Jess-ISWS)
W75-00091

AN INTERACTIVE ALGORITHM FOR THE MULTI-PURPOSE CONTROL OF A NATURAL LAKE,
Arizona Univ., Tuscon. Dept. of Systems and Industrial Engineering. Arizona Univ., Tuscon. Dept. of Hydrology and Water Resources.
For primary bibliographic entry see Field 4A.
W75-00099

LINEAR LEAST SQUARES PREDICTION FOR MULTIVARIATE TIME SERIES WITH MISSING OBSERVATIONS,
Geological Survey, Arlington, Va. Water Resources Div.
For primary bibliographic entry see Field 7C.
W75-00245

OPTIMAL REAL-TIME CONTROL OF URBAN STORMWATER DRAINAGE,
Cornell Univ., Ithaca, N.Y. Dept. of Environmental Engineering.
M. L. Chan.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 858, $7.00 in paper copy, $2.25 in microfiche. 1974 Technical Report No. 87, Studies in the Analysis of Metropolitan Water Resource Systems, Volume X. Cornell University Water Resources and Marine Sciences Center, Ithaca, N.Y. 170 p, 16 fig, 212 equ, 110 ref. OWRT C-3101 (No 3684)(6).

Descriptors: *Storm water, *Routing, *Urban runoff, *Optimization, Control, Drainage, Operations research, Computers, Stochastic processes, Networks, Feasibility, Communication, Monitoring, Mathematical models.

An operational model using optimal control theory is developed for routing urban stormwater drainage comprehensively in a combined sewer network. The stormwater flow dynamics are modeled as a system of linear stochastic difference equations. Together with a quadratic criterion function, the optimization model is posed as a stochastic output regulator problem. The resulting control logic is divided into two parts: the estimator and the controller. The incorporation of this control logic into a central computer, coupled with a monitoring and communication network, forms the core of a real-time computer-based automatic routing control system. This control system can be used to improve the effectiveness of stormwater runoff routing. (Bell-Cornell)
W75-00261

COMPUTATIONAL ALGORITHMS FOR INTERACTIVE PATTERN RECOGNITION,
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
Y. T. Chien.
Available from the National Technical Information Service, Springfield, Va 22161 as PB-236 857, $3.75 in paper copy, $2.25 in microfiche. Technical Report, October 1973. 28 p, 9 fig, 20 ref. OWRT A-042-CONN(3). 14-31-0001-3507.

Descriptors: *Computer models, *Mapping, *Algorithms, Data storage and retrieval, Mathematical studies, Linear programming, Statistics.
Identifiers: *Interactive patterns, Non-linear methods, Man-machine interactions, Computer graphics, Real time, Transformations.

The computational algorithms discussed deal with the mapping of multi-dimensional data to lower dimensional (2 or 3) spaces convenient for human observation and evaluation. Thus, by the use of mathematical techniques with a computer, data transformation is achieved. Both linear and non-linear methods are discussed and their merits and limitations are compared. The notion of recursively applicable algorithms is introduced. Such algorithms require less computation and storage space in the computer to arrive at updated optimal non-linear mappings when such mappings must be repeatedly applied to allow man-machine interaction in the design of a pattern recognition. (See also W75-00267) (Deitchmann-Connecticut)
W75-00266

BIBLIOGRAPHY OF INTERACTIVE PATTERN RECOGNITION AND RELATED TOPICS,
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
Y. T. Chien.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 859, $3.75 in paper copy, $2.25 in microfiche. Technical Report, February, 1974. 29 p, 2 tab, 370 ref. OWRT A-042-CONN(4). 14-31-0001-3507.

Descriptors: *Computer models, Algorithms, Data collections, Surveys, *Bibliographies, Systems analysis, Data processing, Model studies.
Identifiers: *Pattern analysis, *Interactive systems, Image displays, Computer graphics, Perception models.

This bibliography lists literature articles and research reports in the areas of computer interactive pattern analysis and recognition and related topics. The entries are organized in alphabetical order by author's name. To facilitate the usage of the bibliography, a categorization of the entries according to seven topics has been provided. These topics are: Algorithms and Techniques for Interactive Analysis and Recognition; Interactive Systems and Applications; Image Displays and Interactive Graphics; Models of Human Perception and Recognition; Real Time and Online Systems; Data Structures and Software Facilities; and Surveys and General References. (See also W75-00266) (Deitchmann-Connecticut)
W75-00267

IDENTIFICATION OF PUBLICS IN WATER RESOURCES PLANNING,
Georgia Inst. of Tech., Atlanta. Dept. of City Planning.
For primary bibliographic entry see Field 6B.
W75-00268

6B. Evaluation Process

A STUDY OF THE EFFECTIVENESS OF WATER RESOURCES PLANNING GROUPS: A FINAL REPORT,
Utah State Univ., Logan. Center for Water Resources Research.
For primary bibliographic entry see Field 6A.
W75-00001

PROJECT SELECTION BASED ON BENEFITS AND COSTS,
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia). Div. of Building Research.
For primary bibliographic entry see Field 6A.
W75-00018

FIELD MANAGER FOR WATER RESOURCE UTILIZATION,
Bureau of Reclamation, Fresno, Calif. Central Valley Operations Office.
B. Giles.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper No 10893, p 1411-1417, October 1974. 1 fig.

Descriptors: *Water management(Applied), *Water resources development, *Water supply, *Water utilization, Irrigation, Reservoirs, Water rights, Watersheds(Basins), Forecasting, Recreation, Water storage, California.
Identifiers: *Field manager, San Joaquin River(Cal).

Considered are the technical and interpersonal involvements which the field manager must deal with in the management of water resource utilization. The day-to-day relationships between many diverse interests in resolving problems is astounding, given today's multiple-purpose projects. The field manager must stay current with changes in water supply, water uses, and water quality. Today's demands on water supply in the San Joaquin Valley exceed the available supply which must be managed in order to meet the demands of all interests to the greatest possible extent. This paper discusses water supply considerations, effects of new development, meeting the needs of diverse interests, water supply forecasting, water importation, recreation, and underground storage. To accomplish effective management, methods of supply forecasting must be refined. Waste of the resource must be eliminated by managing available storage or developing new methods. The importance of all uses must be recognized by all interests. Recreational needs must be expanded, and the food production capacity of the nation is dependent upon available water. The nation's energy crisis demands utilization of water for purposes of energy. Good management of water resources includes all the needs of the nation's people. (Bell-Cornell)
W75-00028

SHORELINES MANAGEMENT: THE WASHINGTON EXPERIENCE.
Available from the National Technical Information Service, Springfield, Va 22161 as COM-73-11922, $7.00 in paper copy, $2.25 in microfiche. Proceedings of a Symposium, Seattle Center, June 24, 1972. Seattle, University of Washington Press, 1972. 184 p.

Descriptors: *Washington, *Shores, *Government, *Laws, *Administration, Planning, Institutions, Legislation, Management, Beaches, Water conservation, Adoption of practices, Land management, Water policy, Legal aspects, Political aspects, State governments, Beach erosion, Sands, Public access, Zoning, Water resources development, Comprehensive planning, Coasts, Conservation, Water management(Applied), Federal government.
Identifiers: *Administrative regulations, *Coastal zone management, *Coastal waters, *State policy.

A symposium on management and protection of the shorelines of the Washington coast was sponsored by the American Bar Association, Young Lawyers Section and the State of Washington. The symposium centered on a pending referendum on an act to manage the seashores. During the symposium the two competing bills proposed at the state level were argued as well as a federal act sponsored by Senator Magnuson of Washington. The current status of shore legislation was assessed and the future needs projected. Opposing conceptions of shore management and administration were forwarded by state officials, attorneys, and environmental groups. Among the issues debated were questions of oil spill prevention and clean-up, the function of the Coast Guard in oil spills, public access to the seashore and its effects on the beaches, judicial control over the implementation of the act, balancing development and conservation, and optimal allocation of coastal resources. (Salley-Florida)
W75-00105

GROUP CONSIDERS PROPER MANAGEMENT OF COASTAL AREAS.
Environmental Science and Technology, Vol 8, No 7, p 606-607, July, 1974.

Descriptors: *United States, *Coasts, Coastal engineering, *Water management(Applied), Administration, Federal water pollution control act, Federal jurisdiction, Conferences, Water pollution control, *Planning.

The United States, faced with massive increases in coastal zone development, is in a position to lose as much as it could gain, as was stated at the National Oceanic and Atmospheric Administration-sponsored Conference on Coastal Zone Management. In order to assure a balance between the two, a national coastal zone management program is needed. Although many feel more authority is needed at the federal level if the problems of the nation's coastal zones are to be adequately handled, the thrust of the 1972 Act is toward setting up programs in each of the individual states. The local view of the national interest in coastal zone planning and management was discussed. It was stated that natural science identification, assembly, and interpretation are beyond local and probably state capability and should be a federal responsibility. (Sandoski-FIRL)
W75-00113

ENVIRONMENT AND ECONOMIC GROWTH.
For primary bibliographic entry see Field 6G.
W75-00114

SHALL WE DEVELOP MORE WATER,
Wisconsin Univ., Milwaukee. Dept. of Civil Engineering.
V. W. Bacon.
Water and Sewage Works, Vol 121, No 6, p 46-47, June, 1974. 1 tab.

Descriptors: *Water resources development, *Water management(Applied), Water quality control, Waste water treatment, Economics, Water conservation.

Guidelines for effective water philosophy to aid water development and management are presented. Water quantity, water conservation through quality control and the economics of waste water treatment are stressed. (Sandoski-FIRL)
W75-00205

IDENTIFICATION OF PUBLICS IN WATER RESOURCES PLANNING,
Georgia Inst. of Tech., Atlanta. Dept. of City Planning.
G. E. Willeke.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 789, $3.75 in paper copy, $2.25 in microfiche. Georgia Environmental Resources Center, Atlanta, Report No ERC-1774, September 1974. 30 p, 11 ref, append. OWRT B-095-GA(1), B-012-MISS(2), B-075-NC(1), B-081-SC(1) and B-064-VA(1). 14-31-0001-4154.

Descriptors: Communication, Institutions, *Planning, Water resources development, Project planning, Social aspects, *Social participation, Social aspects, Social impact.
Identifiers: *Public participation, *Identification of publics.

The state-of-the-art of identifying publics for water resources studies was surveyed through a combination of literature search, correspondence with researchers and practitioners, and field experience. Since many audience segments are important to water resources planning, the public cannot be taken as a unitary mass. Identification of appropriate audience segments includes locating these publics, determining their interests and their social and demographic characteristics, and establishing communication with them. Publics are identified not so much for a comprehensive list representative of the entire general public, but rather to increase the range and richness of issues and concerns brought to salience in the planning process. Techniques include self-identification, third-party identification, and staff identification. Self-identification is done through petition, appeal, public hearing, election, suit, protest, and publicity. These processes may be enhanced by staff efforts to provide structures for self-identification. Third-party identification is done by asking some person or group to identify those groups or individuals who should be involved in the planning process. Staff identification includes analysis of associations, geographic analysis, demographic analysis, historical and comparative analysis, the use of general lists, field interviews, and analysis of affected publics. Assembling the various techniques into a package for a specific application must be done with a view toward the planning situation, the persons doing the planning, and the social and cultural patterns of the area. Some combination of all three technique groups would probably be found appropriate in almost all planning situations. (James-Geo Tech)
W75-00268

OWEGO ENVIRONMENTAL STUDY,
Cornell Univ., Ithaca, N.Y. Coll. of Architecture, Art and Planning.
For primary bibliographic entry see Field 6G.
W75-00272

RECREATION WATER CLASSIFICATION SYSTEM AND CARRYING CAPACITY,
Idaho Univ., Moscow. Dept. of Civil Engineering.
J. H. Milligan, C. C. Warnick, G. L. Bloomsburg, E. P. Osnick, and S. R. Wagner.
Idaho Water Resources Research Institute, Moscow, Technical Completion Report, September 1973. 89 p, 5 fig, 5 tab, 26 ref, append. Idaho State Parks and Recreation Dept. Project 45-215.

Descriptors: *Recreation, *Carrying capacity, *Idaho, *Classification, Water allocation, *Management, Water utilization, *Methodology, Lakes, Reservoirs.
Identifiers: Slackwater recreation.

A conceptual study has been made of water recreation areas of lakes and reservoirs to provide a classification system that would be useful in managing recreational resource. An analysis of useful related research literature was made and is summarized. A classification system has been developed using a factor profile approach which is a graphical method of presenting important parameters that relate to the management and allocation problems. This approach was applied to several lakes and reservoirs that are representative of the resource in Idaho. A presentation is also made on the concept of carrying capacity as related to recreation type water, primarily lakes and reservoirs. Emphasis has been on developing a conceptual approach and methodology. Additional testing will be required to verify the rating system and its application in determining carrying capacities.
W75-00278

HANDBOOK FOR REGIONAL OR RIVER BASIN PLANNING, (ANNOTATED DRAFT OUTLINE) (LEVEL B).
Water Resources Council, Washington, D.C.
March, 1974. 49 p.

Descriptors: *Planning, *Regional development, *River basin development, *U.S. Water Resources Council, *Comprehensive planning, Water resources development, Alternative planning, Ecology, Environment, Environmental effects, Regional analysis, Evaluation, Future planning(Project), Water management(Applied), Water policy, Land management, Natural resources.

Level B planning is concerned with implementing the primary objectives of a regional tertiary plan. A successful Level B study must consider all laws, policies, standards, procedures, guidelines, and other factors relevant to the project. This outline is the first step in an effort to prepare a working handbook containing everything an experienced planner needs to know about Level B planning. Prepared by the Council's staff, this outline has not yet been officially adopted by the Water Resources Council. The handbook's purpose is to provide a hand guide to determine what studies to undertake, and when, and how to conduct these studies. The outline is designed to provide the framework for a nationwide program of regional and river basin planning, and it reflects a 'new approach' by the Council to Level B planning. This material is applicable to all federal and federally assisted participation in Level B planning under the aegis of the Council. (Deckert-Florida)
W75-00369

A STAFF REPORT ON ALTERNATIVE WATER SUPPLY PROGRAMS FOR THE METROPOLITAN WASHINGTON, AREA.
Corps of Engineers, Boston, Mass. North Atlantic Div.
For primary bibliographic entry see Field 3D.
W75-00370

A SYSTEMATIC EVALUATION OF ENVIRONMENTAL PERCEPTIONS, OPTIMUM PREFERENCES; AND TRADE-OFF VALUES IN WATER RESOURCE ANALYSIS,
Oregon State Univ., Corvallis. Dept. of Agricultural Economics.
D. Pendse, and J. B. Wyckoff.
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 853 $4.75 in paper copy, $2.25 in microfiche. Oregon Water Resources Research Institute, Corvallis, Report WRRI-25, September 1974. 86 p, 10 fig, 23 tab, 17 ref, 8 append. OWRT B-017-MASS(4).

Descriptors: *Cost-benefit analysis, *Environmental effects, Methodology, *Intangible benefits, Evaluation, Social values, *Priorities, *Project benefits, Project planning, Preferences(Water rights).
Identifiers: Trade-offs, Economic analysis, Non-market goods, Analysis techniques.

In the last decade environmental goods such as scenic beauty, environmental quality, and aesthetic and cultural values have caught the attention of the American public. Water resource development projects emphasizing primarily economic benefits are no longer acceptable to the public. The National Environmental Policy Act of 1969 clearly requires that, 'Federal decision-making incorporate environmental values along with technical and economic values, that both short- and long-term effects be given careful consideration.' A study was undertaken as a part of a general research project related to: (1) development of methodology to value intangible benefits by determining intensity of satisfaction of users of water resource projects; and (2) development of procedures for incorporation of such values in the benefit-cost analysis of water resource projects. Numerous techniques have been researched under this project. The particular technique utilized and reported here is the Priority Evaluator. The Priority Evaluator Technique (PET) was found to have considerable potential for overcoming two deficiencies common to many other 'direct approach' techniques, i.e.: (1) failure to obtain trade-off patterns; and (2) failure to estimate the economic value of non-market goods.
W75-00425

AWWA MANAGEMENT PROGRAM DEVELOPMENTS,
Kennedy Engineers, San Francisco, Calif.
W. R. Seeger.
Journal of the American Water Works Association, Vol 66, No 7, p 393-395, July 1974.

Descriptors: *Public utilities, *Management, *Comprehensive planning, *Water supply, *Water resources development, Coordination, Budget, Social aspects, Economic aspects, Technology, Decision-making, Water resources, Project planning, Water management(Applied), Water policy, Water requirements, Adoption of practices, Administration, Administrative decisions.

The American Water Works Association (AWWA) has been developing management programs which have had to meet the dramatic change in society's attitude toward utility operations. Such programs must now coordinate water supply development with the planning functions of communities. There is a complacency on the part of the current leadership of the water utility industry about the need for training people for management positions and resistance to spending money for employee training. Forty percent of middle management people will need to be replaced within the next five years. The industry should budget the money and train its own people. The average manager has not been keeping up with trends of modern management. It is probable that he has never been confronted with a labor negotiation problem or been directly challenged by the questioning public. Employees want to become part of the decision-making effort that goes into the operation of a utility. (Sperling-Florida)

W75-00469

THE WEB OF WATER MANAGEMENT,
Minnesota Dept. of Conservation, St. Paul. Water Section.
E. R. Gere.
Conservation Volunteer, p 54-58, March-April, 1970. 2 illus.

Descriptors: *Minnesota, *Water resources development, *Public benefits, *Resource utilization, *Evaluation, Planning, State governments, Water resources planning, Comprehensive planning, Land management, Economics, Resource allocation, Economic impact, Cost-benefit ratio, Cost-benefit analysis, Environmental effects, Natural resources, Water management(Applied).

Minnesota is known for its lakes and water resources, which constitute its most valuable assets. The state is currently analyzing the adequacy of its water and land related resources to meet future demands. The most difficult problem facing Minnesota is providing for economic growth and utilization of its water resources without jeopardizing the environmental quality. Maintaining existing high quality water resources must be balanced against any water resources development. The determination can not be solely based upon current cost-benefit analysis techniques, because many factors can not be quantitatively evaluated. Any decision must include all values and any alternatives. Because many agencies and persons are interested in the outcome of any decision and because alternative decisions affect all these interested parties, Minnesota must incorporate their input. Many decisions come within the jurisdiction of other governments, agencies or regional committees. Finally, Minnesota's participation in regional programs has been limited by a lack of financial resources. (Barnes-Florida)
W75-00476

6C. Cost Allocation, Cost Sharing, Pricing/Repayment

LOOKING TO EUROPE FOR A POLLUTION TAX MODEL. OR HOW THE CONSUMER WILL PAY.
For primary bibliographic entry see Field 5G.
W75-00119

ESTABLISHING MARKETS FOR WATER QUALITY,
Clemson Univ., Water Resources Research Inst.
For primary bibliographic entry see Field 5G.
W75-00279

THE ANTIPARALLELING STATUTE: A NEW DIMENSION IN PUBLIC UTILITY CONDEMNATION,
Howard, Prim, Rice, Nemerovski, Canady, and Pollak, San Francisco, Calif.
For primary bibliographic entry see Field 6E.
W75-00477

6D. Water Demand

WATER USE RELATIONSHIPS AND PROJECTION CORRESPONDING WITH REGIONAL GROWTH, SEATTLE REGION,
CH2M/HILL, Bellevue, Wash.
R. H. Willsie, and H. L. Pratt.
Water Resources Bulletin, Vol 10, No 2, p 360-371, April 1974. 6 fig, 3 tab, 11 ref.

Descriptors: *Water utilization, *Water demand, *Municipal water, *Industrial water, *Projections, Regional development, Economics, Evaluation, Statistical methods, Regression analysis, Estimating, Seasonal, Human population, Annual. Identifiers: *Water projections, *Seattle(Wash), Growth, Multiple linear regression.

Methods used and results obtained are outlined in a study to quantify water demand -- past, present, and future -- for municipal and industrial purposes in the Seattle region. The demand for water is derived from the demand for output and the direct services water provides. Principal characteristics of the study are: (1) water use is studied by type (residential), commercial, industrial and public) with the identification of factors affecting each, and by season as well as on an annual basis; (2) projections of future water use are tied directly to projections of economic change in the service area; and (3) the effects of alternative policies on water use are estimated. Water use levels are projected under alternative regional growth assumptions provided by the Puget Sound Governmental Conference, a regional planning agency. The results can be varied according to changes in specific factors affecting water use. The factors considered in the present study include: single-family residential lot size, distribution of population between single- and multi-family units, per capita water use by multi-family unit residents, and industrial and commercial water use per employee. An income elasticity of demand was estimated for single-family residential water use. (Bell-Cornell)
W75-00017

THE DEMAND FOR AGRICULTURAL WATER IN UTAH,
Utah State Univ., Logan.
For primary bibliographic entry see Field 6A.
W75-00019

HOW PURE IS OUR WATER SUPPLY.
For primary bibliographic entry see Field 5G.
W75-00122

FACTORS AFFECTING RESIDENTIAL WATER CONSUMPTION: THE MANAGERIAL VIEWPOINT,
Mississippi Univ., University. School of Business Administration.
W. J. Primeaux, Jr., and K. W. Hollman.
Water and Sewage Works, p 138-140, 142-144, April 30, 1974. 3 tab, 4 ref.

Descriptors: *Regression analysis, *Water quality, *Economics, *Mississippi, *Water demand, Project planning, *Water consumption.

A study was calculated through the use of multiple regression analysis on the effect that price and other selected economic and socioeconomic variables have on the quality of water demanded in residential households in northern Mississippi. A regression equation using economic, socioeconomic, and climatic factors was derived to describe water demand. Results suggest that those communities whose water systems managers and planners are able to forecast correctly their future population growth will be in an advantageous position with respect to estimating future demands on their water systems. A final conclusion indicates that the results of this study are somewhat tentative since both the price response and the income response were weaker than those found in other studies. (Sandoski-FIRL)
W75-00139

THE NEW ENGLAND WATER-UTILITY STORY,
Metcalf and Eddy, Inc., Boston, Mass.
For primary bibliographic entry see Field 5G.
W75-00538

6E. Water Law and Institutions

WATER OFFICERS MEET AT PERTH.
Surveyor, No 4275, p 38-39, May 17, 1974.

Descriptors: *Conferences, *Administration, Water management(Applied), Sewage disposal, Tunnels, Rivers, Reservoir operation.
Identifiers: *United Kingdom.

The general mood of the 1974 conference of the Association of Water Officers (AWO) seemed to be that reorganization has added to the association's standing as a professional body. In recounting the historic achievements of the AWO it was noted that from 1965 to 1974 there were ten years of river authorities which had been set up by the 1963 Act. This period saw the evolution of the multipurpose river authority, but it was not fully empowered with regard to pollution. There was ample water in the country in the form of precipitation but it was badly spaced in time and location. The board considered that the correct policy was to have a small number of large reservoirs rather than a large number of small reservoirs. Rivers were used to convey water and tunnels to convey water from one river to another, if necessary. AWO now covers 1400 sewerage and sewage disposal authorities. (Sandoski-FIRL)
W75-00115

EUROPEAN WATER CLEANUP IS UNDER WAY,
For primary bibliographic entry see Field 5G.
W75-00118

WATER RESEARCH IN THE SOVIET UNION,
Canada Centre for Inland Waters, Burlington (Ontario).
S. Barabas.
Chemistry in Canada, Vol 26, No 6, p 14-17, June, 1974.

Descriptors: *Research and development, *Canada, Institutions, *Research priorities, Political aspects, *Information exchange.
Identifiers: *USSR.

A two-man delegation was sent by the Environment Canada to the Soviet Union to identify the Soviet institutes and scientists engaged in inland water research, to inform the Soviets about what Canada is doing in the field, and to lay the foundation for future exchanges of information among the inland water scientists of the two countries. The various institutes visited are listed; a brief account of the discussions held at the various institutes is detailed. (Sandoski-FIRL)
W75-00138

LEGAL ASPECTS OF THERMAL DISCHARGES,
Power Authority of State of New York.
A. J. Martin.
Journal of the Hydraulics Division, Vol 100, No HY 7, p 1059-1072, July, 1974. 34 ref.

Descriptors: *Legal aspects, *Reviews, Design criteria, Thermal pollution, Federal government, Legislation.
Identifiers: *Thermal discharges.

An overview of those legal areas which directly affect technical and planning decisions is presented in the form of two legal approaches which constrain the indiscriminate release of thermal discharges to receiving waters. One takes the form of private remedies which have traditionally been available to aggrieved parties who are in some way damaged by the harmful discharge. The second approach utilizes the various statutory constraints leading to direct governmental action. It appears that statutory law is playing the prominent role in restricting the temperature to which receiving

waters may be raised as a result of such discharges by using effluent limitations and water quality standards. (Sandoski-FIRL)
W75-00203

BRITAIN'S PROMPT ACTION AGAINST MARINE POLLUTION.
Shipbuilding and Marine Engineering International, Vol 97, No 1177, p 255, 257, May, 1974.

Descriptors: *Water pollution control, *Ships, Waste disposal, Waste treatment, Sea water, International waters, International commissions, Oceans.
Identifiers: United Kingdom.

The British House of Commons gave an unopposed Second Reading to the Government's Dumping at Sea Bill which prohibits the dumping in tidal waters and the sea of any substances loaded in a British port or within British waters on to a ship, aircraft, or marine station. Controlled dumping will be subject to a licensing procedure and an inspectorate is to be set up with powers to examine all ships and marine installations and to take samples and documents. The Convention for control will come into force 12 months after the date on which not less than 15 nations have become signatories. A survey of available equipment which can be carried on board and is suitable for complying with the spirit of the Convention on Marine Pollution has been appended to include the manufacturers of specific shipborne equipment. (Sandoski-FIRL)
W75-00206

THE LAW AND THE DESIGNER,
R. Gegauff.
Design News, Vol 28, No 22, p 45-54, November, 1973.

Descriptors: *Water pollution, *Air pollution, *Recycling, Industrial pollution.
Identifiers: *Environmental Protection Agency, *The Occupational Safety and Health Administration, ANSI.

The regulations established by the EPA and OSHA are inspired by the voters' demands for reduced costs, the salvaging of materials by reuse or careful layout, and the consumer demands. Old products are being adapted to meet the new standards, with new products filling newer needs. The OSHA gathered its original standards from the American National Standards Institute, and a problem of interpretation ensued. Standards were revised in more definitive terms, and the Compressed Gas Association was also consulted for further standard gathering. Also adopted were the National Fire Protection Association standards. Now, however, the OSHA and EPA determine their own priorities, employ independent labs, and contract industries to perform studies. With the collapse of the National Industrial Pollution Control Council, the OSHA and EPA are the remaining mediators between industry and government. The concerns of these agencies include: plant safety, air pollution, automobiles in terms of their contribution to the pollution of the environment, water pollution, laundry waste, water reuse, recycling and consumer safety. (Leibowitz-FIRL)
W75-00213

GREAT LAKES RESEARCH ADVISORY BOARD THIRD SEMI-ANNUAL REPORT, APRIL 1974.
For primary bibliographic entry see Field 2H.
W75-00229

DISCUSSION OF REGULATORY CRITERIA FOR OCEAN DISPOSAL OF DREDGED MATERIALS: ELUTRIATE TEST RATIONALE AND IMPLEMENTATION GUIDELINES,
Army Engineer Waterways Experiment Station, Vicksburg, Miss. Office of Dredged Material Research.
For primary bibliographic entry see Field 5G.
W75-00242

RADIOACTIVE WASTE STORAGE IN THE ARID ZONE,
Geological Survey, Reston, Va.
For primary bibliographic entry see Field 5E.
W75-00247

AN ANALYSIS OF LOCAL WATER-RELATED DISTRICTS IN NORTH DAKOTA,
North Dakota State Univ., Fargo. Water Resources Research Inst.
R. B. Crockett.
Available from the National Technical Information Service, Springfield, Va. 22161 as PB-236 814 $4.25 paper copy, $2.25 in microfiche. Research Project Technical Bulletin W1-311-001-72 June 1972 p, 72 p, 18 tab, 3 append. OWRT A-029-NDAK) (I).

Descriptors: *North Dakota, *Water management(Applied), *State governments, *Administrative agencies, *Legislation, Flood control, Irrigation districts, Irrigation, Operation and maintenance, Irrigation practices, Controlled drainage, Adoption of practices, Coordination, Economics, Planning, Water law, Agriculture, Local governments, Inter-agency cooperation, Regulation, Water districts, Water allocation(Policy).
Identifiers: *Administrative regulations.

The relative strengths, weaknesses, and variations in procedure among eight types of boards controlling water policy were assessed. The various boards include water management districts, county drain and park boards, irrigation districts, flood irrigation boards, irrigation corporations, and joint county park boards. There was an unwarranted duplication of efforts and a lack of state-wide coordination. A confused tangle of areas of responsibility compounded coordination problems. The proliferation of procedures and areas of responsibility made the system practically incomprehensible to the lay person attempting to deal with water resources at the local level. These problems are in the broad categories of overly complex organization, financing problems, and an increase of unchecked drainage activities due to a failure of efficient control. Further study should be instituted with an eye toward legislation to simplify the organization of water management and financing, and toward creation of centralized state agency to oversee financial reporting of the various systems. A revamping of the water control system would help alleviate many current problems. (Salley-Florida)
W75-00260

THE ANTARCTIC TREATY: A STEPPING STONE TO THE DEVELOPMENT OF AN INTERNATIONAL SEABED REGIME,
W. E. Rabil, Jr.
In: Sea Grant Publication UNC-SG-73-01, p 51-58, March 1973. 25 ref.

Descriptors: *Law of the sea, *International law, *Treaties, *International waters, *Governmental interrelations, Legal aspects, Water law, Oceans, Foreign trade, Foreign waters, Water rights, Governments, Water resources development, Jurisdiction, Regulation, Negotiations, Continental shelf, Continental margin, Exploitation, Water policy.
Identifiers: *Territorial seas(Jurisdiction), *Environmental policy, *Seabed mining, *International agreements.

The need to devise newer, more acceptable principles by which the law of the sea may effectively regulate the exploitation of the sea's resources has resulted in the United Nation's Conference on the Law of the Sea, scheduled to convene in 1973. The problems facing this conference and those dealt with by the Antarctic Treaty Conference of 1959 are compared. That conference produced the Antarctic Treaty of 1959, which may offer a model for any future agreements concerning the regulation of the area of the seabed beyond the limits of national jurisdiction. The provisions of the treaty are examined and compared with several of the proposals to be considered by the 1973 Conference. An international custodial regime should be established which would oversee the use of the seabed, but would not be in charge of enforcing its rules. Included are suggested solutions to problems facing any custodial type authority. (Deckert-Florida)
W75-00281

THE ATTITUDE OF DEVELOPING COUNTRIES TOWARD INTERNATIONAL AGREEMENTS ON ENVIRONMENTAL CONTROL OF THE OCEAN,
A. W. Wadford, Jr.
In: Sea Grant Publication UNC-SG-73-01, p 68-74, March 1973. 39 ref.

Descriptors: *Political constraints, *Oceans, *International law, *Environmental control, *Governmental interrelations, Treaties, International waters, Legal aspects, Water law, Water policy, Foreign waters, Water rights, Governments, Regulation, Water resources development, Exploitation, Institutional constraints, Negotiations, Water pollution, Political aspects, Water pollution control, Environmental effects, Cost sharing.

While the needs of the world community require that precautions be taken to preserve the sea's limited resources, any such efforts are beset by political, economic, and legal restraints. Several of these factors are examined as they relate to the attitude of developing countries toward control of the ocean. A major problem facing the implementation of international environmental law is that the solutions offered to cure the negative effects of the Industrial Revolution do not provide a means for redistribution of its benefits. Paradoxically, the population growth, higher incomes, and modern technology, which the developing countries seek in order to eliminate their 'pollution of poverty' tend to propagate the 'pollution of affluence' which accompanies industrialization. This conflict contributes to the animosity between the 'have' and 'have not' nations. The developing countries insist that those who have caused the major part of ocean pollution should assume the cost of curing the problem. Only if developed countries offset the economic burdens of environmental concern by additional developmental assistance to the developing countries will any international resolution of the environmental problem be achieved. (Deckert-Florida)
W75-00282

INTERNATIONAL PROTECTION OF MARINE LIFE FROM THE EFFECTS OF POLLUTION DUE TO LAND-RELATED ACTIVITIES,
For primary bibliographic entry see Field 5G.
W75-00283

ATTITUDES OF DISTANT FISHING NATIONS TO THE CONSERVATION OF FISHERY RESOURCES,
A. Haynes.
In: Sea Grant Publication UNC-SG-73-01, p 155-165, March 1973. 42 ref.

Descriptors: *Law of the sea, *Commercial fishing, *Conservation, *Water resources, *International law, Political aspects, Economic

aspects, Marine fisheries, Boundaries(Property), Water resources development, Planning, Social aspects, Fishing, Water law, Disputes(Boundaries), Fish harvest, Fisheries.
Identifiers: *Coastal waters, *Territorial waters.

One of the most persistent problems in the law of the sea has been the conflict between distant fishing nations and coastal nations over the resources of the sea. The issues involved are a tangle of political, economic, and conservational considerations. Coastal waters, contain the best fisheries and are more fertile than waters of the mid-ocean. Coastal nations wish to preserve the offshore fisheries for themselves while nations with wide ranging fleets wish to preserve freedom of high seas fisheries. Many nations contain, at the same time, distant and coastal fishermen. The basic interest involved in limiting coastal fishing is conservation. The more practical question, though, is who gets the available fish. In addition to overfishing, another aspect of conservation of a renewable resource is underfishing. With a hungry world, maximum sustainable yield should be taken or the resource is wasted. (Sperling-Florida)
W75-00284

COOPERATION BETWEEN CANADA AND THE UNITED STATES OF AMERICA IN THE CONSERVATION OF THE LIVING RESOURCES OF THE SEA,
N. Allen.
In: Sea Grant Publication UNC-SG-73-01, p 178-190, March 1973. 87 ref.

Descriptors: *Law of the sea, *Commercial fishing, *Cooperatives, *United States, *Conservation, Political aspects, Economic aspects, Fishing, Fisheries, Legal aspects, Marine fisheries, Water utilization, Environmental effects, Fish harvest, Water resources, International law, Oceans, Canada, Water resources development, Adoption of practices.
Identifiers: *Coastal waters, *International agreements.

Canada and the United States share some of the most cooperative conservation arrangements in foreign relation agreements. The Canadian-American example of cooperation lends promise to the future of other international agreements, not only in regard to fisheries, but analogous areas as well. Modern technology continues to enhance the potential threat of large foreign fishing fleets off the coasts of Canada and the United States. At the 1958 Conference on the Law of the Sea, the United States delegation considered abstention as an essential measure to protect and conserve the living resources of the sea. Though the abstention procedure was rejected by the Conference, the United States unilaterally declared that it will enter into agreements with interested states which will incorporate this sound conservation measure. The United States and Canada have entered into separate agreements with the U.S.S.R. and Japan to conserve certain fisheries of mutual interest. (Sperling-Florida)
W75-00285

PUBLIC WORKS FOR WATER AND POWER DEVELOPMENT AND ATOMIC ENERGY COMMISSION APPROPRIATION BILL, 1975, PARTS 3, 4, 5.
Hearings--Subcomm. on Public Works, Comm. on Appropriations, U.S. House of Reps., 93d Cong, 2d Sess, 1974. 2214 p.

Descriptors: *Economics, *Federal government, *Water management(Applied), *Legislation, *Political aspects, Navigable rivers, Administrative agencies, Coordination, Legal aspects, Planning, Water resources development, Costs, Operating costs, Decision making, Adoption of practices, Water policy, Natural resources, Civil engineering, Construction costs, Resources allocation, Conservation, Land management, Intergovernmental relations, Comprehensive planning.
Identifiers: *Private interest groups, *Administrative regulations, *Congressional hearings.

The record of hearings held by the Subcommittee of the Committee on Appropriations of the House of Representatives represents a compedium of statements, testimony, and studies bearing on appropriations for the Appalachian Regional Commission, the Federal Power Commission, the Interstate Commission on the Potomac River, the Atomic Energy Commission, the Department of the Interior, and the Water Resources Council. The hearings provide substantial data on the activities of all the above agencies in reference to justification of budget requests. Of particular interest are the reports on current federal hydroelectric plants, potential hydroelectric plants in Alaska, a regional water survey in Alaska, and many individual projects of Bureau of Reclamation. (Salley-Florida)
W75-00286

RIPARIAN AND PUBLIC RIGHTS TO LAKES AND STREAMS,
Washington Univ., Seattle. School of Law.
R. W. Johnson.
Washington Law Review, Vol 35, p 580-616, 1960. 167 ref.

Descriptors: *Washington, *Riparian rights, *Water rights, *Appropriation, *Competing uses, Future planning(Projected), Preferences(Water rights), Water allocation(Policy), Legal aspects, Water law, Common law, State governments, Legislation, State jurisdiction, Prescriptive rights, Judicial decisions, Water policy, Recreation, Water resources development, Irrigation, Nonstructural alternatives, Water conservation, Water utilization, Water demand, Water resources.
Identifiers: *Water rights(Non-riparian), *Multiple use concept, *Environmental policy, *Comparative law.

The enactment of the appropriation code of 1917 marked the beginning of the conflict between the riparian and appropriation doctrines in Washington water law. Current trends in water use in Washington are described and in respect to nonnavigable waters only, an analysis is made of where the two systems are meeting the needs of the state and where they are not. Among the questions discussed are: (1) how do the two systems combine; (2) where they combine, which receives the preferred status; (3) what trends are visible in the application of these systems and are the trends desirable. The multiple use concept applied in the management of the state's timber lands should be applied to the control of the state's water resources. The increasing use of lakes and streams for recreation and homesites should encourage the continuation of the court trend toward limiting further expansion of the appropriation system and applying wherever appropriate the more viable principles of riparianism. (Deckert-Florida)
W75-00287

RIPARIAN-APPROPRIATION CONFLICTS IN THE UPPER MIDWEST (A REGIONAL VIEW),
Economic Research Service (USDA), Washington, D.C. Farm Economics Div.
W. A. Hutchins.
North Dakota Law Review, Vol 38, No 2, p 278-301, 1962. 24 p, 70 ref.

Descriptors: *Appropriation, *Riparian rights, *Reasonable use, *Legal aspects, *Water supply, Water demand, Water allocation(Policy), Water requirements, Water utilization, Riparian land, Watercourses, North Dakota, Nebraska, Montana, Wyoming, Colorado, Kansas, South Dakota, Legislation, Land tenure, Water distribution(Applied), Riparian water, Water policy.
Identifiers: *Water rights(Non-riparian), *State policy.

The northern midwest includes North Dakota, South Dakota, Kansas, Nebraska, Montana, Wyoming, and Colorado. Conflicts between riparian and appropriation doctrine adherents have resulted from the establishment of the dual systems of water rights in some states, and the attempted establishment of the riparian part in others. Appropriation rights were acquired on a first come basis, and were beneficially exercised in connection with lands regardless of their continuity to streams. These rights were subject to loss for the failure to use the water for periods of time that were unreasonable or fixed by statute. Riparian rights arose out of ownership of lands contiguous to streams whether or not the rights were exercised by appropriating and using the water. Such rights did not refer to specific quantities of water, but to the use of all water reasonably required for utilization of the riparian land with due regard to the like reasonable requirements of all other riparian proprietors. The clash of these dissimilar ideologies was inevitable where demand was crowding upon available supplies. (Sperling-Florida)
W75-00288

WHO OWNS THE OCEANS,
Aurora Coll., Ill. Dept. of Earth Science.
D. L. Freck.
Student Lawyer, Vol 2, no 8, p 40-42, 53, April 1974. 1 illus.

Descriptors: *International law, *Continental shelf, *Exploitation, Legal aspects, Law of the sea, International waters, Water policy, Governments, Governmental interrelations, Water law, Federal jurisdiction.
Identifiers: *International agreements, *Territorial waters, *Territorial seas(Jurisdiction), *Seabed mining.

There is a rich manganese deposit less than 100 miles out from the coast of Charleston, South Carolina, 1800 feet beneath the Atlantic Ocean. The applicable international law pertaining to seabed mining of this ore is analyzed. Making a decision about ownership of the oceans was never considered as long as the oceans were viewed only as a transportation route or as a natural barrier. The Dutch jurist, Bynershoek proposed in 1702 that territorial waters should extend no further than the effective range of shore cannon. It became customary to establish this limit at three miles. Many nations reserved the right to search and seize vessels up to and even beyond 12 miles for internal revenue purposes. With the advent of submarines and mines this principle began to break down. Since 'the continental shelf is an extension of the coastal nation . . . and since self-protection compels a close watch,' in 1945 President Truman took control of the continental shelves bordering the United States. In 1970 President Nixon announced his support for international control of the ocean beyond the limits of national jurisdiction. (Hall-Florida)
W75-00289

SURFACE WATERS: REASONABLE USE RULE,
W. Roth.
Cornell Law Quarterly, Vol 45, No 4, p 824-831, 1960. 40 ref.

Descriptors: *Water law, *Judicial decisions, *Water rights, *Legal aspects, *Pennsylvania, Regulations, Reasonable use, Alteration of flow, Natural use, Natural flow doctrine, Relative rights, Water utilization, Artificial use, Reservoirs, United States, Surface runoff, Land tenure, Water policy, Adjudication procedure.
Identifiers: *Common Enemy Rule, *Injunctive relief, *Nuisance(Legal aspects), *State policy, *Liability(Legal aspects).

The Supreme Court of Pennsylvania has held that in an artificial use of the land, developers must

make proper accomodations so as not to place the burden of increased flow on the servient tenement. The standard enuciated in this case lies in the distinction between a natural and non-natural use of the land. This language was first employed in a landmark English case, Rylands v. Fletcher, which imposed strict liability for a leak from the defendant's reservoir which flooded plaintiff's mine. The rule evolved that there would be liability when damage is caused by a thing or activity unduly dangerous and inappropriate to the place where it is maintained. In the United States, regardless of whether the rule of Rylands is accepted, if a non-natural use becomes an unreasonable use, an award of damages or injunctive relief will be appropriate. Three rules have developed with surface waters. The common enemy rule lets upper and lower landowners treat the water as a common enemy and cope with it as best they can. The civil law obligates the lower landowner to receive the natural flow of water. The reasonable use rule sets the relative rights of the parties in accordance with what is reasonable. The natural use docrine of Rylands is the third. (Sperling-Florida)
W75-00290

PRIVATE RIGHTS UNDER ILLINOIS DRAINAGE LAW,
G. Ratcliff.
University of Illinois Law Forum, Vol 1960, No 2, p 198-216, Summer 1960. 74 ref.

Descriptors: *Illinois, *Drainage, *Running waters, *Riparian rights, Legal aspects, Reasonable use, Diversion, Watercourses(Legal aspects), Embankments, Levees, Prescriptive rights, Legal aspects, Water law, Civil law, Surface waters, Flood water, Surface runoff, Water policy, Appropriation, Water allocation(Policy), Water resources development.
Identifiers: Water rights(Non-riparian).

The rule regarding the rights and duties of dominant and servient land owners is applied to the following questions: does the rule apply to surface and flood waters the same as to waters flowing in a natural channel; may the flow from the dominant land be increased by the drainage of areas not previously drained; may waters be taken from one watershed and diverted into a watercourse flowing across a servient tract situated in another watershed; may a landowner change the location of a natural channel or enlarge a natural channel on his own land; may a lower or servient landowner erect only levees or embankments which might change or affect the flow of waters from the upper or dominant lands; does the rule apply to municipalities, highways and railroads; does the size of the channel have any bearing on the application of the rule; may prescriptive rights be acquired which will change the operation of the rule; and upon whom does the duty fall of maintaining a watercourse across a servient tract. (Hall-Florida)
W75-00291

IDAHO ENVIRONMENTAL STATUS AND PROGRAM EVALUATION, 1972.
Environmental Protection Agency, Seattle, Wash. Region X.
Available from the National Technical Information Service, Springfield, Va. 22161 as PB-227 235, $4.25 in paper copy, $2.25 microfiche. Dec. 1972. 60 p, 16 tab, 16 fig.

Descriptors: *Idaho, *Water pollution sources, *Federal government, *Standards, *Water quality, State governments, Coordination, Potable water, Adoption of practices, Economics, Rivers, Water management(Applied), Public health, Administrative agencies, Planning, Manpower, Environmental sanitation, Basins, Water supply, Budgeting, Decision making, Personnel management, Aquifers, Groundwater, Alluvial aquifers, Aquifer management, Water law, Water policy, Environmental effects, Water quality standards, Public health, Water resources, Water resources development.
Identifiers: *State policy, *Administrative regulations, *Environmental impact statement.

In view of Congress' express intent to leave much of the control of environmental programs in the hands of the states, this analysis of the specific weaknesses in the water management programs of Idaho is designed to upgrade the state's water quality programs with a minimum of direct federal involvement. In the area of public drinking water the state had allocated insufficient funds and manpower. The procedural checks on sampling were inadequate; as a result of the problems there was significant risk to public health in the future. The water quality of the state rivers is excellent, and there has been a significant improvement from the early 1960's, when massive fish kills were an annual event in the Snake River. Nevertheless, specific problems still require correction. The survey outlines deficiencies in each of the four major river areas in Idaho: the Spokane, the Upper Snake, the Middle Snake, and the Lower Snake. The major problems include heated water, industrial waste, and algae blooms. Less specific was the analysis of the groundwater supply which was threatened by subsurface disposal of wastes polluting the aquifers. Although in general the waters of Idaho are of good quality, greater attention and funding will be required to maintain or improve it. (Salley-Florida)
W75-00292

THE POTOMAC: PUTTING THE PIECES TOGETHER.
Interstate Commission on the Potomac River Basin, Bethesda, Md.
Annual Report, 1973. 24 p, 6 fig.

Descriptors: *Interstate commissions, *Interstate rivers, *Potomac River, *Planning, *Water resources development, Water policy, State governments, Federal government, Project purposes, Coordination, Cooperation, Standards, Regulation, Pollution control, Pollution abatement, Conservation, Watershed protection, Legislation, Land use, Water quality control, Effluents, Waste disposal, Waste treatment, Sewage disposal, Water supply, Water law.
Identifiers: *Administrative regulation.

Planning on a single state basis, as well as Commission-wide planning was the focus of the efforts of the Interstate Commission on the Potomac River Basin in 1973. The Commission concluded that conservation and preservation, although essential, must be balanced against development of the Potomac's resources to support growing population, economic expansion and other regional objectives. Consideration must be given to all of the diverse and often conflicting interests in dealing with high-density suburban development, watershed protection, wilderness and wildlife preservation, energy production, industrial siting, recreational development, sewage and waste treatment, and water resources planning. Coordination of these interests falls squarely on the Commission. The first step in establishing such a planning process is to determine the total maximum daily pollution load of the Potomac, and to limit the input necessary to meet water quality standards in the river where effluent standards are inadequate. Each state is required to develop an inventory and ranking, in order of priority of needs for construction of pollution control facilities. Timetables and quidelines are being developed and implemented to assure an adequate water supply, sufficient water resources and a general land-use plan. (Silber-Florida)
W75-00295

HIGHWAYS--FLOOD DAMAGE--PROPOSED MODIFICATION OF THE COMMON ENEMY RULE,
J. L. O'Brien.
Wisconsin Law Review, Vol 1963, p 649-661, July 1963. 43 ref.

Descriptors: *Legal aspects, *Drainage, *Surface runoff, *Surface waters, Drainage water, Streamflow, Floods, Storm runoff, Construction, Natural flow, *Wisconsin, Legislation, Watercourses, Percolation, Reasonable use, Water management(Applied), Land management, Water utilization, *Flood damage.
Identifiers: *Common enemy rule.

It is impossible to build a modern highway without interfering with the natural flow of the surface water. The consequent rights of highway authorities and abutting landowners have been a frequent source of litigation. In some states, the flooding of land through the obstruction or diversion of surface water constitutes a taking of property requiring just compensation. Common law rules in Wisconsin precluded such a result and left the landowner without a remedy until a statute was passed in 1913. Surface water as opposed to watercourses and percolating water is discussed. The oldest rule governing the use of surface water is the common enemy rule. This rule provides that a landowner may divert, obstruct, or alter the flow of surface water to or from his premises in any manner he sees fit. The only limitation is that he may not first accumulate the surface water and then discharge the accumulation on his neighbor. The civil law rule of surface water is that a person who interferes with the natural flow of surface waters is liable. The third rule and most recent is the reasonable use doctrine. (Sperling-Florida)
W75-00296

PUBLIC RIGHTS IN MAINE WATERS,
Maine Univ., Arono. School of Law.
G. G. Waite.
Maine Law Review, Vol 17, p 161-204, 1965. 237 ref.

Descriptors: *Riparian rights, *Legal aspects, *Judicial decisions, *Water policy, *Maine, Water allocation(Policy), International law, Federal government, State governments, Regulation, Recreation, Public benefits, Water law, Public rights, Watercourses, Easements, Conservation, Political aspects, Access routes, Adoption of practices, Wildlife conservation, Intergovernmental relations.
Identifiers: *Injunctive relief, *Public trust doctrine, *Water rights(Non-riparian), *State policy.

Land that borders on a stream, lake or ocean carries with it certain rights to use the water. When the watercourse is navigable the private rights are subordinate to the rights the public has to use the water. In Maine public rights in water are controlled by an interplay of state, federal and international law. Suggestions are offered on how to improve the quality of public rights in order to enrich recreational opportunities in Maine. Maine cases developing the law of public rights in water have spoken of the rights being held by the state in trust for the public. They have also stated the law as the public having an easement to use watercourses in particular ways. The trust doctrine and the easement concept both suggest that these public rights are property rights. Treating public rights as property and preferring them to riparian rights could be a powerful tool available for protecting public rights from private encroachment. (Sperling-Florida)
W75-00297

ROLE OF LOCAL GOVERNMENT IN WATER LAW,
A. Saltoun.
Univ. of Wisconsin Law Review, Vol 1959, p 117-141, January 1959. 104 ref.

Descriptors: *Water requirements, *Water supply, *Local governments, *Regulation, *Water resources development, Water demand, Con-

sumptive use, Water shortage, Drought, Water rates, Construction, Legal aspects, Political aspects, Judicial decisions, Wisconsin, Resources allocation, Water allocation(Policy), Water distribution(Applied), State governments, Water sources, Water conservation, Water control.
Identifiers: *Administrative regulations, *State policy.

Despite overall abundant water resources, some areas in Wisconsin will be faced with a water shortage. This problem will occur becuase the population is growing, per capita consumption is rising, and the need for water by industry and agriculture is mounting, while the supply of water remains relatively constant. This study is concerned with the extent to which local government plays a part in shaping private and public rights to use water. Almost all of the water utilities in Wisconsin are municipally owned. Rates charged, areas served, amount of water pressure maintained, and mains or wells constructed must be cleared with the Public Service Commission. A city council, by ordinance, may impose a restraint upon water users if reasonable and approved by the Commission. Many municipalities have declared by ordinance that sprinkling is restricted in order to conserve water. A Wisconsin circuit court case upheld the right of a city to regulate the water supply. There is no doubt such city ordinances will be upheld as a valid exercise of the police power. (Sperling-Florida)
W75-00298

SOME OBSERVATIONS ABOUT THE FEDERAL WATER POLLUTION CONTROL ACT AMENDMENTS OF 1972,
Hand, Arendall, Bedsole, Greaves and Johnston, Mobile, Ala.
For primary bibliographic entry see Field 5G.
W75-00300

PUBLIC RIGHTS IN INDIANA WATERS,
State Univ. of New York, Buffalo. School of Law.
G. G. Waite.
Indiana Law Journal, Vol 37, p 467-488, Summer 1962. 98 ref.

Descriptors: *Indiana, *Public rights, *Navigable waters, *Non-navigable waters, *Water courses, Navigation, Lakes, Drainage, Ditches, Reasonable use, Zoning, Water pollution control, Water law, Water policy, Land management, Water allocation(Policy), Rivers, Riparian rights, Appropriation, Water resources development, Judicial decisions, Legal aspects, Social aspects.
Identifiers: State policy, Public trust doctrine, Water rights, Non-riparians.

Public rights to use water in Indiana are statutory except for navigation and fishing rights. The statutory rights apply only to lakes and not to streams. Thus, even though streams that are useful have been declared to be public water, only the narrow rights of public use created by the Indiana Supreme Court exist on streams. Indiana courts have not used the public trust doctrine in developing the case law of public rights in water. The courts have tried to balance the interests of the conflicting users. Conflicting private uses of land and water authorized by the state are likely to be allowed at the expense of the public waters. In 1955 water in any natural lake or other natural body of water which could be applied to 'any useful and beneficial purpose' was declared to be a natural resource and public water of the state. The statute's preamble impliedly states that recreational use is a 'beneficial purpose'. The statute's constitutionality is analyzed. Public rights to use water have indirectly been enhanced by the legislature through statutes protecting Indiana watercourses from various physical hazards. (Hall-Florida)
W75-00301

AIRPORTS, SUBDIVISIONS AND SURFACE WATERS,
Ohio Northern Univ., Ada. Coll. of Law.
J. Munro.
Univ. of Cincinnati Law Review, Vol 30, No 4, p 391-417, Fall, 1961. 74 ref.

Descriptors: *Ohio, *Judicial decisions, *Surface runoff, *Legal aspects, *Land management, Easement, Channels, Streamflow, Construction, Flood protection, Water policy, Diversion, Legislation, Regulation, Watershed, Drainage systems, Diversion structures.
Identifiers: *Common enemy rule.

In an early Ohio case between two adjoining landowners, it was held that the owner of the upper tract has a natural easement or servitude in the lower land. Surface water may be drained from the higher land into its natural outlet. In connection with reasonable improvements to his property, the upper owner can increase the volume and accelerate the flow of such water, provided such water is allowed to flow into channels or natural depressions on the higher land, without incurring liability. The upper owner cannot divert the direction of the natural drainage. The lower owner must accept the water and not block off these waters so as to back them up on his neighbors. This above rule of servitude only applies to rural land. As to urban land the common enemy rule is applicable. Both of these principles have been modified. A capacity-of-the-stream rule has been adopted which takes away the right to overflow the channel. These rules were more workable in connection with a single dwelling than with the large developments now springing up on the fringe of cities. (Sperling-Florida)
W75-00302

DIVERSION OF LAKE MICHIGAN WATERS,
Michigan Attorney General's Office, East Lansing.
P. L. Adams.
Univ. of Detroit Law Journal, Vol 37, p 149-156, 1959. 6 ref.

Descriptors: *Illinois, *Legal aspects, *Waste water disposal, *Lake Michigan, *United States, Canal, Effluents, Regulation, Watershed protection, Legislation, Diversion, Permits, Navigation, Fishing, Wildlife conservation, Beaches, Economic aspects.
Identifiers: *Injunctive relief.

In the early part of this century Chicago initiated a plan of disposing of its sewage by means of a canal to discharge the sewage into the Mississippi watershed. In 1913 the United States, through a federal court order, enjoined Chicago from diverting more than 4,167 c.f.s. of water from Lake Michigan, which had been authorized by permits from the Secretary of War. The Supreme Court affirmed this action in 1925. The court pointed out that the United States was exercising paramount power to regulated commerce and to carry out the treaty obligation assumed under the Boundaries Water Treaty of 1909. A few months after the court decision the Secretary gave a temporary permit allowing diversions up to 8,500 c.f.s. Other states became alarmed and filed bills against Illinois and also contended the permit issued by the Secretary was ultra vires and void. A special master found that serious injuries were caused by the diversion with reference to navigation, fishing and hunting grounds, beaches, public parks, and many commercial enterprises. The Supreme Court entered a decree reducing the diversion in 1930. (Sperling-Florida)
W75-00303

STATE OF OHIO V. CALLAWAY, ET AL. (CITIZEN'S SUIT CHALLENGING CORPS OF ENGINEERS ACTION).
For primary bibliographic entry see Field 5G.
W75-00304

UNITED STATES, ET AL. V. RESERVE MINING CO., ET AL. (POLLUTION OF INTERSTATE OR NAVIGABLE WATERS).
For primary bibliographic entry see Field 5G.
W75-00305

POLLUTION CONTROL STRATEGIES.
For primary bibliographic entry see Field 5G.
W75-00306

TERMS AND CONDITIONS OF PERMITS -- NPDES.
For primary bibliographic entry see Field 5G.
W75-00307

ENFORCEMENT OF DISCHARGE VIOLATIONS.
For primary bibliographic entry see Field 5G.
W75-00308

PROPOSED REGULATIONS--AQUACULTURE PROJECTS.
For primary bibliographic entry see Field 5G.
W75-00309

NATURAL RESOURCES DEFENSE COUNCIL, INC. V. TRAIN (ADMINISTRATIVE DISCRETION--EFFLUENT STANDARDS).
For primary bibliographic entry see Field 5G.
W75-00310

COLORADO PUBLIC INTEREST RESEARCH GROUP, INC. V. TRAIN (NUCLEAR POWER PLANTS--RADIOACTIVE MATERIALS DISCHARGE).
For primary bibliographic entry see Field 5G.
W75-00311

UNITED STATES V. STOECO HOMES, INC. (OBSTRUCTION OF NAVIGABLE WATERS).
1 Pollution Control Guide, Vol 3, paragraph 15073, p 15519-15524, July 15, 1974. 3 ref.

Descriptors: *Rivers and Harbors Act, *Dredging, *Navigable waters, *Water pollution, *Judicial decisions, Channels, Regulation, Federal government, Permits, Abatement, Bulkheads, United States, Environment, Jurisdiction, Inland waterways, Government, Runoff, Sludge, Pipes, Encroachment, Refuse, New Jersey, Construction, Harbors, Environmental effects, Administrative agencies, Administrative decisions, Water policy.
Identifiers: *Injunctive relief, *Refuse Act of 1899, *Navigational obstruction, *Estoppel, *Environmental policy.

In this environmental protection action, plaintiff United States seeks a permanent restraining order, enjoining defendant, developer, from conducting dredge, fill and construction operations in waters which plaintiff contends are navigable waters of the United States. Plaintiff alleges that these operations were conducted without the prior approval of the Army Corps of Engineers (Corps) and the Secretary of the Army. Plaintiff further alleges that these operations constitute a public nuisance in violation of the federal common law and that they irreversibly alter the natural condition of the development site and irreparably damage the environment. Defendant denies all allegations and asserts the defenses of estoppel and laches, and the denial of equal protection through enforcement of the statutes. The United States District Court held that a developer who conducts such operations without securing the proper authorization violates the navigational obstruction provision of the Rivers and Harbors Appropriation Act and may be enjoined therefrom. In accordance, the court ordered that defendant be permanently enjoined and restrained from engaging in such development activities without the prior

recommendation of the Corps and approval of the Secretary of the Army. (Chennault-Florida)
W75-00312

UNITED STATES V. STOECO HOMES, INC. (OBSTRUCTION OF NAVIGABLE WATERS).
1 Pollution Control Guide, Vol 3, paragraph 15074, p 15524-15533, July 15, 1974. 9 ref.

Descriptors: *Rivers and Harbors Act, *Navigable waters, *Dredging, *Silting, *Judicial decisions, *Adjudication procedure, Estuaries, Lagoons, Marshes, Bulkheads, Dikes, Excavation, Environment, Permits, Jurisdiction, United States, Tidal waters, Channel, Barriers, Encroachment, Runoff, Harbors, Administrative agencies, New Jersey, Conservation, Environmental effects, Federal government, Administrative decisions.
Identifiers: *Injunctive relief, *Environmental impact statement, *Navigational servitude, Coastal waters, Refuse Act.

Defendant developer appealed from an order issued in a suit by the United States which permanently enjoined defendant from engaging in or permitting any dredge, fill, or construction operations in the area in issue without the prior recommendation of the Army Corps of Engineers and approval of the Secretary of the Army as required by the Rivers and Harbors Appropriation Act. The District Court found that the activities of defendant caused silting in the lagoons and obstructed navigation and that the premises in question were within navigable waters of the United States. Defendant on appeal contended that the silting did not take place in such navigable waters; that even if the waters were navigable the injunction was over broad; and that plaintiff had not established that the premises were within its navigable waters. The Court of Appeals concluded that the injunction ordered by the District Court could not be sustained because it was too broad. Therefore, the court ruled that the injunction appealed from being vacated and the case remanded for the entry of a modified injunction in accordance with its opinion. (Chennault-Florida)
W75-00313

BILL TO ESTABLISH LAND USE POLICY.
House, Washington, D.C.
H.R. Rep. No. 10294, Comm. on Interior and Insular Affairs, 93d Cong, 1st Sess, September 13, 1973. 55 p.

Descriptors: *Land use, *Environment, *Environmental effects, *Conservation, *Nonstructural alternatives, Planning, Ecology, Wetlands, Watershed management, Land development, Water utilization, Erosion control, Flood control, Federal government, State governments, Legislation, Government finance, Land resources, Land management, Natural resources, Conservation, Adoption of practices, Social benefits.
Identifiers: *Administrative regulations.

This bill was introduced as a proposed National Land Use Planning Act. Its purposes are: to establish land use policy; to authorize the Secretary of the Interior to make grants to assist the states to develop and implement comprehensive land use planning processes; to coordinate federal programs and policies which have a land use impact; to make grants to Indian tribes to assist them to develop and implement land use planning processes for reservation and other tribal lands; and to provide land use planning directives for the public lands. Thus the policy will be to assure that land is used in ways that create and maintain conditions under which man and nature can exist in productive harmony. A comprehensive land use planning process is one in which all land and other natural resources within a state are taken into account. Wetland and watershed protection are one aim of this legislation, as is implementation of flood-control programs through land use regulation. (Ritchie-Florida)
W75-00365

WATER LAW--ACT OF GOD DEFENSE--FLOOD DAMAGE FROM RESERVOIR OVERFLOW (BARR V. GAME FISH AND PARKS COMMISSION, 497 P. 2D 340),
K. T. Sanford.
Denver Law Journal, Vol 50, p 381-388, 1973. 27 ref.

Descriptors: *Acts of God, *Overflow, *Spillways, *Reservoirs, *Reservoir design, Water law, Legal aspects, Floods, Judicial decisions, Design flood, Damages, Flood damages, Flood plain management, Planning, Adoption of practices, Water policy.

A recent decision of the Colorado Court of Appeals is the vehicle for examining the viability of the act of God defense to a claim for damages resulting from a reservoir overflow. Colorado has a statute which provides for absolute liability for damages resulting from overflow from a reservoir. The opinion of the appellate court adheres to the accepted precedent that proven foreseeability of a given occurrence will preclude the act of GOD defense. The court, however, created a standard of foreseeability based on what a reasonable engineer should have foreseen using engineering techniques that yield maximum flood predictability. The novelty of this test is compared to earlier Colorado case law. The potentially serious ambiguities created by this change in the law are also examined. A strict application of the absolute liability statute without exception would yield a more desirable result. (Gragg-Flordia)
W75-00366

MARYLAND SHAPES HER RICHEST MARSHES.
Outdoor America, p 6-7, February 1974. 3 illus.

Descriptors: *Conservation, *Legal aspects, *Commercial fishing, *Marshes, *Wetlands, Ecology, Environment, Environmental effects, Fish, Shellfish, Salt marshes, Coastal marshes, Aquatic environment, *Maryland, Judicial decisions, Zoning, Land development, Productivity, Economic justification, Dredging, Sedimentation, Land management, Natural resources, Resources development.
Identifiers: *Coastal zone management.

Maryland's Eastern Shore contains some of the most ecologically vital salt marshes along the entire United States coastline. Numerous species of finfish and shellfish rely heavily on the wetland nurseries for their existence. Maryland conservationists are distrubed about the resort community construction in the marshes, and have launched an all-out battle to halt wetlands degradation. They fear that planned dredged will destroy the shellfish population. A county zoning plan has declared certain of the coastal marshes to be important natural assets that should not be destroyed. However, a recent hearing resulted in the granting of a zoning variance to permit intensive development in a portion of the marsh despite intense citizen disapproval. A legal battle ensued, on which final appeals have not been heard. If the lower court's decision stands, conservationists feel there is little chance to stop any development rezoning in wetland-rich Worcester County, despite findings that the marshes are justified on economic grounds because of their rich high productivity. (Ritchie-Florida)
W75-00371

UPPER SUWANNEE RIVER, EVALUATION OF A PROPOSED DRI AS AN AREA OF CRITICAL STATE CONCERN, COLUMBIA AND HAMILTON COUNTIES, FLORIDA.
Florida Div. of State Planning, Tallahassee. Bureau of Land Planning.
For primary bibliographic entry see Field 4A.
W75-00372

REPORT OF PROCEEDINGS CONCERNING THE RECLASSIFICATION OF VARIOUS STREAMS IN NORTH CAROLINA, SECTION 1, HICKORY PUBLIC HEARING JUNE 29, 1972.
North Carolina Dept. of Natural and Economic Resources, Raleigh. Office of Water and Air Resources.
For primary bibliographic entry see Field 4A.
W75-00373

HISTORY OF DRAINAGE CHANNEL IMPROVEMENT IN THE VERMILION RIVER WATERSHED, WABASH BASIN,
Illinois State Water Survey, Urbana.
For primary bibliographic entry see Field 4A.
W75-00424

WATER POLLUTION CONTROL IN NEW JERSEY,
Rutgers the State Univ., New Brunswick, N. J. Bureau of Government Research.
For primary bibliographic entry see Field 5G.
W75-00429

COLORADO WATER LAWS, COMPACTS, TREATIES AND SELECTED CASES,
Available from the National Technical Information Service, Springfield, Va. 22161, as PB-236 923 $7.25 in paper copy, $2.25 in microfiche. State of Colorado, Denver, Division of Water Resources, 1971. 204 p, (Compiled and edited by G. E. Radosevich. OWRT B-043-COLO(5).

Descriptors: *Colorado, *Legal aspects, *Water law, Compacts, Treaties, Judicial decisions, Water quantity control, Eminent domain, Water rights, Irrigation, Reservoirs, Public rights, Legislation.

Presented are those sections of the constitution and statutes pertaining to creation, adjudication, and administration of water rights; distribution of waters of the state of Colorado; apportionment of interstate streams by compact and treaty; and the two recent 'federal reserve doctrine' cases involving Colorado. Annotations and sources are excluded. Statutes included are those dealing with reservoir companies, flume and pipeline companies, eminent domain, water rights, irrigation, reservoirs, exchange of water, river compacts, and river basin authorities. In addition, constitutional provisions with reference to mining, irrigation, waters of streams, diverting unappropriated water, and right-of-way for ditches are included. The full text of the Mexican Treaty on the Colorado, Tijuana, and Rio Grande Rivers is contained herein. This volume will be kept current with yearly pocket inserts containing revisions of included laws and new water quantity statutes. (Mockler-Florida)
W75-00430

CONSTITUTIONAL LAW--DUE PROCESS--NOTICE PROVISIONS OF WATER SUPPLY ACT CONSTITUTIONAL--SCHROEDER V. CITY OF NEW YORK.
Albany Law Review, Vol 26, p 321-325, 1962. 22 ref.

Descriptors: *New York, *Legislation, *Constitutional law, *Public rights, *Judicial decisions, Riparian rights, Land tenure, Water law, Legal aspects, Legal review, Condemnation, Riparian land, Water rights, Administration, Water supply, Planning, Water resources development, Governmental interrelations, Federal jurisdiction, Adjudication procedure, Federal government, State governments.
Identifiers: *Due process, *Nuisance(Legal aspects), *Citizen suits, *Dam effects, *Notice.

The New York Water Supply Act of 1905 is the authority under which New York City has secured a water supply for its citizens. In the title case, the constitutionality of the notice provisions of this

act was challenged. The plaintiff riparian landowner argued that, in light of the United States Supreme Court holdings in Mullane v. Central Hanover Trust Co. and Walker v. City of Hutchinson, the provisions of the act requiring notice by publication and posting were not reasonably calculated to inform those parties affected by pending government actions. The plaintiff contended that owners of record were entitled to personal notice by mail. The New York high court rejected the plaintiff's argument and held that the provisions of the act were reasonable. Two judges dissented. It is concluded that even though the plaintiff had actual notice, a fact which the New York majority considered important, the United States Supreme Court will probably overturn the decision and rule the provision unconstitutional. In Wuchter v. Pizzutti, the U.S. court ruled that actual notice could not redeem otherwise inadequate notice provisions. (Deckert-Florida)
W75-00458

CONGRESS SHOULD REEVALUATE THE 160-ACRE LIMITATION ON LAND ELIGIBLE TO RECEIVE WATER FROM FEDERAL WATER RESOURCES PROJECTS.
Comptroller General of the United States, Washington, D.C.
Report to the Congress No. B-125045, November 30, 1972. 28 p, 2 tab, 2 ref, 3 append.

Descriptors: *Water allocation(Policy), *Arid land, *Irrigable land, *Land use, *Farm use, Planning, Water resources development, Agriculture, Legislation, Irrigation practices, Economic aspects, Water law, Social aspects, Legal aspects, Water supply, Administrative agencies, Federal government, Multipurpose projects, California, Adoption of practices, Land management, Water policy, Evaluation.
Identifiers: *Administrative regulations, *Water rights(Non-riparians).

The Department of the Interior asked Congress for a re-evaluation of the one-hundred and sixty-acre limitation on land eligible to receive water from federal water resources projects. The Department operates multipurpose water resources projects, primarily to provide irrigation water to arid and semiarid lands in the western states. Objectives of the acreage limitation in the Reclamation Act of 1902 were to provide for a maximum of settlers on the land, promoting the family-size farm, and to spread irrigation benefits to the maximum number of people. The General Accounting Office reviewed the Central Valley project in California to determine how the bureau was administering the acreage limitation. It found that large landowners and farm operators have not been prevented from benefiting under the subsidized irrigation program. Landowners have not been prevented from acquiring large land holdings. The impact of modern technology on farming raises a question of practicability of limiting the use of water to 160 acres. (Sperling-Florida)
W75-00459

SMITH V CITY OF WOODSTOCK (ACTION BY RIPARIAN OWNERS TO ENJOIN OPERATION OF UPSTREAM SEWAGE TREATMENT PLANT).
309 N.E.2d 45 (Ill App 1974).

Descriptors: *Illinois, *Riparian rights, *Sewage treatment, *Storm drains, *Judicial decisions, Municipal wastes, Drains, Floods, Downstream, Natural flow, Erosion, Surface waters, Runoff, Watercourses, Water pollution, Discharge(Water), Upstream, Watersheds(Basins), Soil erosion, Effluents, Disposal, River basins, Channels, Surface runoff, Water pollution control, Legal aspects, Adjudication procedure, Conservation.
Identifiers: *Presumptions(Legal), *Injunctive relief, *Nuisance(Legal aspects), *State policy.

This action by plaintiffs, lower riparian owners, sought to enjoin operation of an upstream sewage treatment plant and construction of a proposed storm drain. Plaintiffs alleged that the threat of future flooding and contamination from the sewage plant discharge of effluents directly into the river would damage them as would the threat of future flooding as a result of the proposed storm drain. The trial court issued injunction sought by plaintiffs. Defendant city of Woodstock appealed contending that the trial court had abused its discretion. The appellate court determined that the trial court had erred in issuing the injunction to the sewage treatment plant since that court had found no present or immediate threat of irreparable injury to lower riparian owners. On the matter of the threat of future flooding from the proposed storm drain, however, the appellate court found the plaintiffs were entitled to injuctive relief. Accordingly, the court affirmed the order enjoining the construction of the proposed storm drain and reversed and remanded the portion based upon the threat of future flooding and contamination from the operation of the sewage treatment plant. (Chennault-Florida)
W75-00460

AMENDING THE ACT OF AUGUST 31, 1954, PROVIDING FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF THE MICHAUD FLATS IRRIGATION PROJECT.
H.R. Rep No 883, Comm. on Interior and Insular Affairs, 91st Cong, 2d Sess, March 9, 1970. 6 p.

Descriptors: *Contract administration, *Government contracts, *Federal reservations, *Irrigation, *Water supply, Federal government, Farm use, Government finance, Water requirements, Water resources development, Adoption of practices, Legal aspects, Administration, Administrative agencies, Construction, Canals, Pumping, Land tenure, Economic aspects, Water uses, Water law, Legislation.
Identifiers: Administrative regulations.

This bill before Congress provides for the construction, maintenance, and operation of the Michaud Flats Irrigation Project. The purpose is to authorize the Secretary of the Interior to sign water supply contracts on behalf of Indian owners of land who live within the Fort Hall Indian Reservation. The contracts would permit the delivery of irrigation water to the Indian lands. Construction of irrigation facilities was originally authorized in 1931, and reauthorized in 1954. The 1954 act provided that before irrigation works could be constructed, contracts must be signed by the landowners, agreeing to certain limitations on water supply and certain priorities of use. Pumps, main canals, and laterals have been constructed to serve all the lands of the tribe, most of the lands of the individual Indians, and all the lands of non-Indians. Some owners of undivided interests, totalling 1,963 acres, have not signed. This has prevented the delivery of water to the reservation. The bill provides that if a contract is signed by persons owning at least fifty percent of the interests, the Secretary may execute a contract on behalf of the non-signing owners. (Sperling-Florida)
W75-00461

CARTER V LEE (ACTION FOR DAMAGES CAUSED BY DIVERSION OF NATURAL FLOW OF WATER).
502 S.W.2d 925 (Tex App 1973).

Descriptors: *Texas, *Diversion, *Cities, *Drainage, *Natural flow doctrine, Reasonable use, Adjacent landowners, Damages, Zoning, Land use, Local governments, Construction, Water law, Surface runoff, Water policy, Surface drainage, Surplus water, Judicial decisions, Legal aspects, Alteration of flow.
Identifiers: *State policy.

Plaintiff, landowners, brought an action for damages against defendant, adjoining landowners. Defendants had constructed a subdivision on their land with the consent of the city. Plaintiff alleged that defendants' construction had diverted the natural flow of the surface water onto plaintiff's land causing damage. Although state statute made it unlawful for any private entity to divert the natural flow of surface water, the trial court held for the defendant. On appeal the verdict for the defendant landowners was reversed on procedural grounds. The appellate court stated that a municipality has the exclusive right to regulate drainage within the city limits, but it is incumbent upon the city to use ordinary care to avoid injuring the property of its citizens. Providing drainage is not a governmental function exempt from liability. Since the finding that the city unreasonably permitted the diversion, jury instructions should have been given to that effect. The case was remanded for new trial. (Hall-Florida)
W75-00462

HODGE V CITY OF MARMADUKE (ACTION TO ENJOIN CITY FROM DISCHARGING INTO PRIVATE DRAINAGE DITCH).
503 S.W.2d 174 (Ark 1974).

Descriptors: *Arkansas, *Prescriptive rights, *Effluents, *Percolation, *Judicial decisions, *Sewage effluents, Legal aspects, Flow, Wastes, Water pollution sources, Wells, Water quality, Sewage treatment, Waste water treatment, Sewage, Easements, Water pollution, Water utilization, Groundwater, Adjudication procedure.
Identifiers: *Nuisance(Legal aspects).

Plaintiff-appellant, drainage ditch and water well owner, brought an action to enjoin defendant appellees, city and others, from discharging effluent into the ditch. Defendants asserted a prescriptive right to use the drainage ditch as an outlet for its treatment plant. The Supreme Court, supporting defendant's contention, stated that a prescriptive flowage easement may be acquired by open, notorious, exclusive and adverse use for seven years. Even if the effluent from the treatment plant percolates from the ditch into the well, an issue of fact upon which the evidence was in dispute, the resulting contamination of the water was biologically harmless and would not impair the health of one who drinks it. Plaintiff argued that the treatment plant constituted a private nuisance. Defendant countered that plaintiff's having tolerated the situation for seven years, precluded his objection. (Hall-Florida)
W75-00463

WILTON BOAT CLUB V HAZELL (QUIET TITLE ACTION AS TO SHORELINE AND ACCRETED LAND).
502 S.W.2d 273 (Mo 1973).

Descriptors: *Missouri, *Accretion(Legal aspects), *Boundaries(Property), *Shores, *Judicial decisions, Adverse possession, Legal aspects, Properties, Rivers, Water law, Water policy, Riparian rights, Boundary disputes.

Plaintiff-appellee, members of a boat club, brought suit to quiet title to a newly accreted land fronting on the river. Defendant appellant, alleged record-title owner, sought to quiet title, ejectment of plaintiffs and counterclaimed for damages through trespass by the plaintiffs. Plaintiffs claimed title by adverse possession. The Supreme Court held that the requisite elements of adverse possession, hostile, open and notorious, and exclusive possession, had not been supported by the evidence. The defendant owned the portion of the disputed land that she held by the recorded deeds. The defendant also lawfully owned that portion that had accreted upon the original tract, since the initial conveyance to defendant. (Hall-Florida)
W75-00464

BUCKS COUNTY BOARD OF COMMISSIONERS V COMMONWEALTH OF PENNSYLVANIA PUBLIC UTILITIES COMMISSION (APPEAL FROM PUBLIC UTILITIES COMMISSION ORDERS).
313 A.2d 185 (Pa Commwlth 1973).

Descriptors: *Environmental protection, *Pennsylvania, *Judicial decisions, *Oil industry, *Regulation, Air pollution, Water pollution, Public health, Public welfare, Oil waste, Pollution sources, Water quality, Fuels, Oil exploitation, Oil pollution, Environmental effects, Legal aspects, Water quality control, Legal review, Adjudication procedure, Administrative decisions.
Identifiers: *Public trust doctrine, *Administrative regulations, *State policy, *Certification, *Private interest groups.

This action before the Commonwealth Court of Pennsylvania is an appeal from orders of the Public Utility Commission granting a certificate of public convenience authorizing the carrier to transport by pipeline petroleum products to be used for electric generation. Appellants are county boards of commissioners, county planning commissions, the trustees of a railroad, a regional environmental committee, and one individual. Appellants contend that the Utility Commission erred in failing to apply the state constitutional provision to the request for certification. The constitutional provision declares that the people have the right to clean air, pure water and the preservation of the natural, scenic, historic and aesthetic values of the environment. Appellants assert that the pipeline will have adverse effects on the enumerated interests and must be prohibited. In affirming the orders of the Public Utility Commission, the court explained that the applicable constitutional provision implied a normal development of property within the context of natural resource protection. The court upheld that judicial review of the endless decisions resulting from balancing environmental and social concerns must be realistic, not merely legalistic. In this instance possible environmental harm was outweighed by benefits to be derived. (Sperling-Florida)
W75-00465

WELLS V STATE HIGHWAY COMMISSION (SUIT BY LANDOWNERS FOR SILT DAMAGE TO LAKE CAUSED BY ROAD CONSTRUCTION).
503 S.W.2d 689 (Mo 1973).

Descriptors: *Missouri. *Eminent domain, *Adjacent landowners, *Surface waters, *Judicial decisions, Silts, Mud, Bodies of water, Construction, Lakes, Discharge, Road construction, Damages, Adjudication procedure, Surface runoff, Legal aspects, Runoff, Discharge(Water), Local governments.
Identifiers: Common enemy doctrine.

Plaintiff, landowners, brought action against the defendant, highway commission, for damages to their lake caused by accumulation of silt and mud from highway construction. Plaintiff alleged that his private property had been taken or damaged for public use without compensation in violation of the state's constitution. There was no doubt that the silt and mud which drained from the road construction was the cause of the damage. Defendant contended, however, that plaintiff failed to show the essentia elements of his cause of action. Affirming the lower court's directed verdict for the landowners, the court stated that the defendant cannot artificially collect surface water and discharge it upon his neighbor's property in increased flow and destructive potential. The court also stated that the defendant must act within reasonable limits, and not recklessly develop his land if he expects to benefit from the common enemy doctrine. Further, the discharge of 25,000 cubic yards of mud combined with water into plaintiff's lake could not be classified as surface water and the discharge constituted an invasion of the lake owner's property. (Hall-Florida)
W75-00466

COMMONWEALTH OF KENTUCKY, DEPT. OF HIGHWAYS V S. AND M. LAND CO., INC (ACTION FOR DAMAGES FOR UNREASONABLY ALTERING NATURAL DRAINAGE).
503 S.W.2d 495 (Ky 1972).

Descriptors: *Kentucky, *Judicial decisions, *Damages, *Drainage practices, *Road construction, Roads, Highways, Culverts, Drainage effects, Drainage engineering, Erosion, Floods, Drainage systems, Drainage ditches, Riparian land, Riparian rights, Penalties(Legal), Channelling, Water management(Applied), Water law.
Identifiers: Jury instructions.

An action was brought against the Department of Highways of the Commonwealth of Kentucky for damage to residential lots affected by the changes of flow created by the drainage structures of the Highway Department. The Circuit Court held for the plaintiff and defendant appealed. Construction of a road, ditches and a culvert concentrated the water which formerly collected in natural drain and caused to flow in a different location in a greater volume and at greater speed. Plaintiff contended that this caused considerable damage to his property. Defendant contended that the water was discharged into a natural drain in the only reasonable method possible. The Court held that although a lower owner is bound to accept natural drainage from an upper owner, the rights of the upper owner are not unlimited. The Court of Appeals upheld the jury's finding that the Department had unreasonably changed the natural drainage and had substantially damaged plaintiff's land. The Court of Appeals affirmed the judgement of liability but reversed on the amount of damages the jury awarded, and remanded the case to the lower court for further proceedings. (Dillingham-Florida)
W75-00467

THE CHEMEHUEVI TRIBE OF INDIANS V FEDERAL POWER COMMISSION (LICENSING JURISDICTION OF FEDERAL POWER COMMISSION INVOLVING EFFECT ON NAVIGABILITY).
489 F.2d 1207 (D.C. Cir 1973).

Descriptors: *Colorado River Basin, *Thermal powerplants, *Thermal pollution, *Federal Power Act, *Judicial decisions, Thermal water, Administrative agencies, Electric power, Powerplants, Erection, Air pollution, Water pollution, Water pollution sources, Thermal power, Legislation, River systems, Navigable rivers, River regulation, Cooling water, Water supply, Water conservation, Water quality, Adoption of practices, Legal aspects, Environmental effects, Water quality control, Water pollution control.
Identifiers: *Administrative regulations, *Standing(Legal), *Private interest groups.

Plaintiff-Indian tribe joined by an environmental interest group sought judicial review of an administrative decision that six fossil-fuel power plants under construction on the Colorado River which used the river to obtain cooling waters in a manner affecting its navigability, were not subject to the licensing jurisdiction of the Federal Power Commission (FPC). Plaintiffs contended that the plants are likely to create severe air and water pollution, threaten the integrity of many natural, historical and recreational resources and disrupt the ecology of the Four Corners region and that the FPC had jurisdiction over their construction. The FPC contended that the electric generating plants were not properly classified within its authority. The Court of Appeals District of Columbia Circuit held that thermal electric power plants are not 'project works' which are within the licensing authority of the FPC under the provisions of the Federal Power Act even though hydroelectric plants are within its jurisdiction. The FPC was judged to have power to license the use of surplus water by such plants. The case was remanded to the FPC to consider the surplus water question. The Court expressed sympathy with the position of the plaintiffs because no agency regulates the construction of thermal electric plants. (Dillingham-Florida)
W75-00468

WHERE DOES THE BEACH BEGIN AND TO WHAT EXTENT IS THIS A FEDERAL QUESTION,
Washington Univ., Seattle, School of Law.
C. E. Corker.
Washington Law Review, Vol 42, p 33-118, 1966. 86 p, 297 ref.

Descriptors: *Beaches, *Judicial decisions, *Government, *Adjudication procedure, Accretion(Legal aspects), Erosion, Boundaries(Property), Vegetation, Administrative agencies, Navigation, Water law, Legal aspects, Water policy, Adoption of practices, Federal government, State governments.
Identifiers: *State policy.

The beach can be defined either by the vegetation line criteria or by the mean high tide standard. Two judicial decisions offer the conflicting theories of law. In Hughes v State, the Washington Supreme Court held that the vegetation line is the boundary of the beach while in Borax Consolidated, Ltd. v Los Angeles, the United States Supreme Court held that the elevation of the average high tide of a waveless ocean establishes the boundary. Also discussed is the accretion issue, which contemplates the question whether the beach boundary, regardless of how it is defined, became fixed at statehood or whether it varies with the on-going processes of accretion and erosion. The most important consideration favoring an accretion role is access to the water. The Hughes decision supports the accretion rule. (Sperling-Florida)
W75-00470

WATER POLLUTION: GOVERNMENTAL ACTIVITIES IN BROWARD COUNTY,
Florida Atlantic Univ., Boca Raton.
For primary bibliographic entry see Field 5G.
W75-00471

THE PUBLIC TRUST: A NEW CHARTER OF ENVIRONMENTAL RIGHTS,
For primary bibliographic entry see Field 6G.
W75-00472

DRBC (DELAWARE RIVER BASIN COMMISSION) ENDS A DECADE OF GROWTH.
Journal of Water Pollution Control Federation, Vol 45, No 4, p 585-587, April 1973.

Descriptors: *Delaware River Basin Commission, *Water quality control, *Water pollution control, *Interstate commissions, *Federal Water Pollution Control Act, River basin commissions, Delaware River, Interstate rivers, Water law, Environmental protection, Pollution abatement, Water use, Recreation, Public welfare, Research, Groundwater management, Waste water, Waste treatment, Water conservation, Planning, Water resource development, Natural resources, Water resources.
Identifiers: *National Environmental Policy Act, *Administrative regulations.

The Delaware River Basin Commission in its tenth year of operation has assessed its long-term effectiveness in promoting water quality in the Delaware River Basin. The Commission views its immediate role as an arbiter among complex issues and competing river water uses. The basin commission was set up in 1962 as an equal partnership between the Delaware River Basin states and the

United States government. Its goal is the planning, development, management and protection of the water resources of the Delaware River Valley. Critics have attacked the Commission for having only limited success as an innovation in regional planning. A major outgrowth of the Commission's study was the establishment of a new environmental unit which specifically deals with water quality. This unit coordinates the Commission's programs with the requirements of the National Environmental Quality Act. The Commission has established cooperative policies with other jurisdictions to regulate pollution discharges into the river, reclaim estuaries to provide an early warning system for pollution spills, and to regulate groundwater management and protection. The Commission recognizes the necessity of policy reevaluation to meld their efforts with the national pollution abatement policy set forth in the Federal Water Pollution Control Act. (Sperling-Florida)
W75-00475

THE WEB OF WATER MANAGEMENT,
Minnesota Dept. of Conservation, St. Paul. Water Section.
For primary bibliographic entry see Field 6B.
W75-00476

THE ANTIPARALLELING STATUTE: A NEW DIMENSION IN PUBLIC UTILITY CONDEMNATION,
Howard, Prim, Rice, Nemerovski, Canady, and Pollak, San Francisco, Calif.
S. R. Pollak, and H. M. Downs.
Journal of the American Water Works Association, Vol 65, No 12, p 750-757, Dec 1973.

Descriptors: *Eminent domain, *Public utilities, *Water districts, *Condemnation, *Water rates, Economic impact, Public health, Damages, Legal aspects, Regulations, Control, Real property, Legislation, Utilities, Facilities, Water rights, Jurisdiction, Rates, Easements, Salvage value, Compensation, Municipalities, Reservoirs, Water distribution(Applied), Water law, Water policy, Waste treatment facilities, Administrative agencies, Local governments, Political aspects.
Identifiers: *Water rights(Non-riparian), *Injunctive relief, *Administrative regulations.

How does the doctrine of eminent domain affect private water suppliers. What happens when a municipal agency begins supplying water to an area previously served by a private company. What rights does a municipal agency have that are denied to the private water supplier. These questions and others are discussed based on a recent California case interpreting sections 1500-1506 of the Public Utilities Code. These sections grant privately owned companies the right to be paid just compensation for the diminution in their property value resulting from duplication of their facilities by a political subdivision. That legislation is significant, first, because of the growing trend for public water agencies to replace investor-owned and mutual water companies, and second, because it reflects an expanding acceptance of public responsibility for private injury resulting from governmental action pursued in the name of the common good. Although the new legislation evidences numerous problems arising out of poor draftsmanship, it has withstood constitutional challenge and is now regarded as validly established law. (Chennault-Florida)
W75-00477

6F. Nonstructural Alternatives

AN ANALYSIS OF LOCAL WATER-RELATED DISTRICTS IN NORTH DAKOTA,
North Dakota State Univ., Fargo. Water Resources Research Inst.
For primary bibliographic entry see Field 6E.
W75-00260

WHERE DOES THE BEACH BEGIN AND TO WHAT EXTENT IS THIS A FEDERAL QUESTION,
Washington Univ., Seattle, School of Law.
For primary bibliographic entry see Field 6E.
W75-00470

6G. Ecologic Impact Of Water Development

A REVIEW OF ENVIRONMENTAL IMPACT ASSESSMENT METHODOLOGIES,
Battelle Columbus Labs., Ohio.
M. L. Warner, and E. H. Preston.
Copy available from GPO Sup Doc as EP1.23:600/5-74-002, microfiche from NTIS, Springfield, Va. 22161 $2.25. Environmental Protection Agency, Socioeconomic Studies Series, Report EPA-600/5-74-002, April 1974. 27 p, 17 ref. EPA Contract 68-01-1871.

Descriptors: *Assessments, Evaluation, *Environmental effects, Reviews, *Methodology.
Identifiers: *Environmental Impact Statements.

Seventeen tools or methodologies designed for or applicable to the preparation of environmental impact statements are reviewed to identify their strengths, weaknesses, and potential range of use. Specific criteria are suggested for evaluating the adequacy of an input assessment methodology in terms of: Impact identification, Impact measurement, Impact interpretation, Impact communication, Resource requirements, Replicability, and Flexibility. The reviews presented serve as an introduction to the range of tools available and demonstrate that no single approach to impact assessment is superior in all circumstances. (EPA)
W75-00013

ENVIRONMENT AND ECONOMIC GROWTH.
Environmental Science and Technology, Vol 8, No 7, p 608-609, July, 1974.

Descriptors: *Economics, Investigations, United States, Solid wastes, *Environmental control, Cost-benefit analysis, *Pollution abatement.

An intensive study by the Committee for Economic Development (CED) showed the following results: there will be a steady increase in the economic recovery of solid waste for fuels and materials; the United States can afford and achieve a high-quality environment if it adopts programs that weigh costs against benefits to produce maximum effectiveness; and, environmental progress will require more economic growth to carry the cost of pollution control programs. The CED foresees either lack of vigorous enforcement or widespread government regulation of business decisions with regards to the 1972 clean water law amendment. As an alternative to regulation, the CED calls for the use of effluent fees in the form of a monetary charge per unit of waste discharged. Careful regulation of toxic discharges would be retained. (Sandoski-FIRL)
W75-00114

HOW PURE IS OUR WATER SUPPLY.
For primary bibliographic entry see Field 5G.
W75-00122

OWEGO ENVIRONMENTAL STUDY,
Cornell Univ., Ithaca, N.Y. Coll. of Architecture, Art and Planning.
J. Gentili, and M. J. Lavine.
Available from the National Technical Information Service, Springfield, Va 22161, as PB-236 785, $5.25 in paper copy, $2.25 in microfiche. Landscape Architecture Graduate Program, June 1974. 103 p, 7 fig, 22 maps, 3 append. OWRT A-045-NY(1). 14-31-0001-4032.

Descriptors: *Environment, *Natural resources, *Land use, *Management, Projects, *New York, Information exchange, Mapping, *Decision making, *Landscaping, Land resources, Geomorphology, Environmental effects.
Identifiers: *Owego(New York), Physical resources.

The study aims to present the residents of New York's southern tier Town of Owego with a compendium of information regarding their environment, particularly the naturally-occurring and man-made physical resources of the Town. Five chapters report on: (I) inventory of the existing conditions of natural systems, including topographical, geological, hydrological, climatic, historic and cultural, scenic, and soil considerations; (II) the natural processes, including microclimate, landslide, erosion, runoff, and flood processes; (III) the analysis and mapping of natural system and land use compatibility relationships; (IV) development of a procedure of project review; and (V) an inventory of environmental management tools. To broaden the knowledge of the unique identity of the Town, socio-economic profiles were prepared early in the study process. These profiles, along with a report on land use planning in Tioga County and maps of existing land uses, constitute appendices to the study. The compendium can be used by planners and designers as a basis for decisions relating to proposed alterations of the Owego landscape. (Bell-Cornell)
W75-00272

PUBLIC WORKS FOR WATER AND POWER DEVELOPMENT AND ATOMIC ENERGY COMMISSION APPROPRIATION BILL, 1975, PARTS 3, 4, 5.
For primary bibliographic entry see Field 6E.
W75-00286

IDAHO ENVIRONMENTAL STATUS AND PROGRAM EVALUATION, 1972.
Environmental Protection Agency, Seattle, Wash. Region X.
For primary bibliographic entry see Field 6E.
W75-00292

ATCHAFALAYA RIVER AND BAYOUS, CHENE, BOEUF, AND BLACK, LOUISIANA (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, New Orleans, La.
For primary bibliographic entry see Field 4A.
W75-00293

OPERATION OF COUGAR LAKE PROJECT AND CONSTRUCTION OF MCKENZIE RIVER SALMON HATCHERY, MCKENZIE RIVER BASIN, LANE COUNTY, OREGON (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, Portland, Oreg.
For primary bibliographic entry see Field 4A.
W75-00294

NORTH SIDE COLLECTION SYSTEM FRYING-PAN-ARKANSAS PROJECT, COLORADO (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Bureau of Reclamation, Denver, Colo.
For primary bibliographic entry see Field 8A.
W75-00299

BRUSH BAYOU, LOUISIANA. ASSOCIATED WATER FEATURE, BOGGY AND CYPRESS BAYOUS, WALLACE LAKE, (FINAL ENVIRONMENTAL IMPACT STATEMENT),.
Army Engineer District, New Orleans, La.
For primary bibliographic entry see Field 4A.
W75-00367

MARYLAND SHAPES HER RICHEST MARSHES.
For primary bibliographic entry see Field 6E.
W75-00371

UPPER SUWANNEE RIVER, EVALUATION OF A PROPOSED DRI AS AN AREA OF CRITICAL STATE CONCERN, COLUMBIA AND HAMILTON COUNTIES, FLORIDA.
Florida Div. of State Planning, Tallahassee. Bureau of Land Planning.
For primary bibliographic entry see Field 4A.
W75-00372

A SYSTEMATIC EVALUATION OF ENVIRONMENTAL PERCEPTIONS, OPTIMUM PREFERENCES; AND TRADE-OFF VALUES IN WATER RESOURCE ANALYSIS,
Oregon State Univ., Corvallis. Dept. of Agricultural Economics.
For primary bibliographic entry see Field 6B.
W75-00425

THE PUBLIC TRUST: A NEW CHARTER OF ENVIRONMENTAL RIGHTS,
J. Sax.
In: Defending the Environment, Ch 7, p 158-174, 1971.

Descriptors: *Public rights, *Legal aspects, *Water law, *Environment, *Law enforcement, Environmental effects, Legal review, Pollution abatement, Air pollution, Water pollution, Water pollution control, Environmental controls, Environmental sanitation, Judicial decisions, Regulation, Water policy, Conservation.
Identifiers: *Public trust doctrine, *Standing(Legal).

If an individual should come into court to protest the government-approved construction or operation of a factory on the ground that it will degrade the ambient air to an unreasonable degree, he has no body at law to support such a claim. The United States should adopt the old Roman legal theory known as the 'doctrine of the public trust.' The theory is founded on the idea that certain common properties such as rivers, the seashore, and the air, were held by government in trusteeship for the free and unimpeded use of the general public. Such resources are considered as owned by no one, with the public having certain undefined rights of use and enjoyment. American law adopted the concept, but has applied it to only a few sorts of public properties such as shorelands and parks. However, the doctrine is readily adaptable to the whole range of issues that comprise the current environmental dilemma. (Ritchie-Florida)
W75-00472

MORGAN CITY, LOUISIANA, AND VICINITY (FINAL ENVIRONMENTAL STATEMENT).
Army Engineer District, New Orleans, La.
For primary bibliographic entry see Field 8A.
W75-00474

MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI, VOL I-II (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, St. Louis, Mo.
For primary bibliographic entry see Field 8A.
W75-00478

7. RESOURCES DATA

7A. Network Design

COMPARISON OF CALCULATION METHODS FOR EVAPORATION USING LAKE BALATON AS AN EXAMPLE,
National Meteorological Service, Budapest (Hungary).
For primary bibliographic entry see Field 2D.
W75-00059

THE GEOPHYSICAL BEHAVIOR OF THE ENVIRONMENTAL ISOTOPES AS A BASIS FOR MODEL CALCULATIONS IN ISOTOPIC HYDROLOGY (DAS GEOPHYSIKALISCHE VERHALTEN DER UMWELTISOTOPE ALS BASIS FUER MODELLRECHNUNGEN IN DER ISOTOPENHYDROLOGIE),
For primary bibliographic entry see Field 5B.
W75-00158

TESTING OF METHODS FOR DETERMINATION OF URBAN RUNOFF,
Dalton-Dalton-Little-Newport, Inc., Cleveland, Ohio.
For primary bibliographic entry see Field 4A.
W75-00212

WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
For primary bibliographic entry see Field 4A.
W75-00241

7B. Data Acquition

A THERMAL WAVE FLOWMETER FOR MEASURING COMBINED SEWER FLOWS,
Hydrospace-Challenger, Inc., Rockville, Md.
For primary bibliographic entry see Field 5B.
W75-00006

OIL SPILL SURVEILLANCE SYSTEM STUDY,
Texas Instruments, Inc., Dallas, Tex.
For primary bibliographic entry see Field 5A.
W75-00007

EXPERIENCES OF LAKE CURRENT MEASUREMENTS OBTAINED IN CONNECTION WITH WASTE WATER FLOW STUDIES,
State Inst. for Technical Research, Otaniemi (Finland). Reactor Lab.
For primary bibliographic entry see Field 5B.
W75-00030

A TELEMETERING SYSTEM INCLUDING CURRENT METERS OF THE BUOYANT KITE TYPE,
Helsinki City Engineer's Office (Finland). Water Conservation Lab.
J. Hari.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Sciences Publications No 109, p 13-17, 1973. 4 fig, 2 ref.

Descriptors: *Current meters, *Instrumentation, *Basic data collections, *Water balance, Remote sensing, Hydrologic data, Measurement, Hydrography, Hydrology, Lakes, Velocity, Logging(Recording), Telemetry.
Identifiers: *Physico-geography, Buoyant kite current meter.

Intensive hydrographical study is being done in the area around Helsinki City, which is characterized by low salinity and shallow depths. In order to gather simultaneous current, water level, and temperature material over long periods a fixed telemetering system was built containing 70 channels. Meters are connected to the telemetering stations by cables up to 1.5 km long. The telemetering stations are connected to the logger station by radio links from 2 to 12 km long. In the system, current measurement is based on the determination of the position of a buoyant kite sensor by two potentiometers mounted orthogonally. This measuring principle was found to be suitable for measurements of long duration and for very small velocities. (See also W75-00029) (Humphreys-ISWS)
W75-00032

UTILIZATION OF RADAR REGISTRATIONS IN DROGUE MEASUREMENTS,
Uppsala Univ., (Sweden). Dept. of Physical Geography.
J. I. Mattsson.
In: Hydrology of Lakes Symposium; Proceedings of The Helsinki Symposium, July 1973, Helsinki, Finland, International Association of Hydrological Science Publication No 109, p 33-41, 1973. 7 fig.

Descriptors: *Remote sensing, *Instrumentation, *Currents(Water), *On-site data collections, Hydrologic data, Radar, Tracking techniques, Measurement, Automation, *Lakes, Data collections.
Identifiers: *Sweden(Lake Velen), Physico-geography, *Drogue measurements.

A method for automatic recording of the position of drogues on Lake Velen, Sweden, was developed. The method was based on radar tracing of drogues and photographing the indicator screen at set intervals. A radar station was installed on an anchored raft and mooring ropes were pulled tight to insure directional stability. Relevant information present in photographs was transformed to digital form with a coordinatometer and punched on tape for computer input. Data were processed on a computer to provide tabulated times, coordinates, velocities and directions of each drogue, and to plot drogue trajectory. (See also W75-00029) (Humphreys-ISWS)
W75-00033

NATURAL ELECTRIC FIELD IN FRESHWATER LAKES,
Limnologicheskii Institut, Irkutsk (USSR).
For primary bibliographic entry see Field 2H.
W75-00037

SPECTRAL REFLECTANCE OF WATER CONTAINING SUSPENDED SEDIMENT,
Agricultural Research Service, Chickasha, Okla. Southern Great Plains Watershed Research Center.
For primary bibliographic entry see Field 2J.
W75-00104

WATER POLLUTION TELEMETRY SYSTEM (IN JAPANESE),
For primary bibliographic entry see Field 5A.
W75-00108

INFLUENCE OF BOUNDARY RESISTANCE ON MEASUREMENTS OF UNSATURATED HYDRAULIC CONDUCTIVITY WITH THE DOUBLE MEMBRANE PRESSURE APPARATUS, (IN GERMAN),
Niedersaechsisches Landesamt fuer Bodenforschung, Hanover (West Germany).
For primary bibliographic entry see Field 2F.
W75-00121

MEASURING ELECTRODE POTENTIALS IN ANAEROBIC DIGESTION WITH STAINLESS STEEL ELECTRODES,
For primary bibliographic entry see Field 5D.
W75-00131

MAGNETIC FLOWMETER THAT KEEPS ITS NOSE CLEAN,
D. Neish.
Process Engineering, p 61, May, 1974.

Descriptors: *Instrumentation, *Electrodes, *Flowmeters, Construction materials, Sewage treatment, Waste water treatment.
Identifiers: Transmitter unit.

Taylor Instruments has designed a self-cleaning electrode with the following three basic different features: the leading edge is a gentle slope while the trailing edge is steep; the actual conductive part of the electrode is a small eye in the center of the leading edge; and, the remainder of the electrode is coated with a tough insulating material called Nucerite. This electrode is embodied in a new range of magnetic flowmeters designed for use in sewage, sludge, and effluent treatment. The electrodes are made of Carpenter 20 Cb3, a corrosive-resistant stainless steel. The flowmeters, designated the Mag-Pipe 1210L series, have additional junction boxes that plug into the side of the transmitter unit. This enables the customer to install his field wiring in the junction boxes and then seal them to be watertight. If flooding occurs, the transmitter is rendered temporarily inoperative without damaging the instrument. (Sandoski-FIRL)
W75-00133

METHOD AND APPARATUS FOR DETECTING PARTICULATE MATERIAL IN FLOW STREAM,
Mobil Research and Development Corp., New York City. (Assignee).
For primary bibliographic entry see Field 2J.
W75-00178

KEEPING WATCH ON WASTEWATER,
Camp, Dresser and McKee, Boston, Mass.
For primary bibliographic entry see Field 5D.
W75-00189

WATER CHARACTERISTICS,
Maine Univ., Orono.
For primary bibliographic entry see Field 5A.
W75-00197

MODIFIED PENMAN METHOD FOR POTENTIAL EVAPOTRANSPIRATION FROM FOREST REGIONS,
Department of the Environment, Ottawa (Ontario). Inland Waters Branch.
For primary bibliographic entry see Field 2D.
W75-00210

APPLICATION OF SENSITIVITY ANALYSIS TO RESERVOIR DESIGN AND WORTH OF STREAMFLOW DATA,
Geological Survey, Fort Collins, Colo.
For primary bibliographic entry see Field 8B.
W75-00244

TRITIUM HYDROLOGY STUDIES IN CALIFORNIA,
California Univ., Los Angeles. Dept. of Chemistry; and California Univ., Los Angeles. Inst. of Geophysics.
J. S. Leventhal, and W. F. Libby.
In: Tritium; Messenger Graphics Publishers, Phoenix, Arizona and Las Vegas, Nevada, p 724-736, May 1973. 7 fig, 4 tab, 22 ref.

Descriptors: *Tritium, *Tracers, *Groundwater movement, *California, Artificial recharge, Hydrogeology, Water spreading.

Tritium is an ideal tracer for water since it is part of the water molecule and follows the complete hydrologic cycle. This makes it a useful medium for measuring the processes that transport water. Its 12.4 year half-life provides a method for determining the time since the water was in the atmosphere. In 1961, in cooperation with the Los Angeles County Flood Control District, a project was initiated to measure the tritium in wells in the section of Los Angeles known as the Downey Plain. The area of the study includes an artificial recharge area (Rio Hondo and San Gabriel Spreading Grounds) which receives imported water via the Metropolitan Water District Aqueduct from the Colorado River. The data show the greatest tritium in the areas where the most recharge is occurring. This area is between and adjacent to the Rio Hondo and San Gabriel Rivers. Horizontal movement from the spreading grounds is more important than vertical percolation. A program was undertaken in 1965 to explore the uses of tritium in predicting run-off and recharge in the Eastern Sierra Nevada Mountains-Owens Valley in east-central California. A general picture of low tritium content in the lower aquifer, and surface infiltration from river and canals in the upper aquifer seems to be established. The low tritium content of Big Springs and Fish Slough Springs indicates that the average age of these waters is more than ten years. The source of these springs is thought to be alluvial material southwest of Big Springs and west of Fish Slough. (Knapp-USGS)
W75-00277

A SATELLITE-TRACKED BUOY IN THE AGULHAS CURRENT,
Natal Univ., Durban (South Africa). Oceanographic Research Inst.
C. C. Stavropoulos, and C. P. Duncan.
Journal of Geophysical Research, Vol 79, No 18, p 2744-2746, June 20, 1974. 4 fig, 9 ref.

Descriptors: *Ocean circulation, *Indian Ocean, *Ocean currents, *Remote sensing, Oceanography, Satellites(Artificial), Data collections, Eddies, Africa, Tracking techniques.
Identifiers: *South Africa(Agulhas Current), Satellite-tracked buoy.

A spar buoy with a subsurface drogue was successfully tracked by Eole satellite for 89 days in the Agulhas current system from July 16 to October 12, 1973. The first 13 days of its track indicated the presence of a cyclonic eddy, which may be a permanent feature, centered at 31 deg 15 min S, 33 deg 10 min E. Further south, the rapid eastward return of the current at an acute angle was confirmed, as was the presence of a large anticyclonic eddy about 300 km offshore. (Hunphreys-ISWS)
W75-00330

LACUSTRINE ZOOPLANKTON CATCHING EFFICIENCY OF TWO NETS WITH DIFFERENT MOUTH DIAMETERS, (IN ITALIAN),
Parma Univ. (Italy). Istituto di Zoologia e Anatomia Comparata.
I. Ferrari, and O. Rossi.
Arch Oceanogr Limnol. Vol 17, No 3, p 275-286, 1972, English summary.

Descriptors: Europe, Seasonal, Analytical techniques, *Zooplankton, *Sampling.
Identifiers: Clarke-Bumpus plankton sampler, *Italy(Lake Maggiore), Lacustrine, Zooplankton, Nets.

The efficiency of towed nets with regard to the catch of the different size classes of the lacustrine zooplankton was tested by using 2 Clarke-Bumpus plankton samplers with nets of 12.70 and 30.48 cm mouth diameters. The samples were collected in pelagic waters of Lake Maggiore (Italy). The data were elaborated statistically. The results are discussed separately for the different sets of samples collected in spring and summer.--Copyright 1974, Biological Abstracts, Inc.
W75-00368

RADAR RAINFALL PATTERN OPTIMIZING TECHNIQUE,
National Severe Storms Lab., Norman, Okla.
For primary bibliographic entry see Field 2B.
W75-00505

ESTIMATION OF PLANT WATER STATUS WITH THE (BETA)-GAUGE,
Agricultural Research Council, Trumpington (England). Plant Breeding Inst.
H. G. Jones.
Agric Meteorol. Vol 11, No 3, p 345-355, 1973, Illus.

Descriptors: *Water balance, Leaves, *Cotton.
Identifiers: Gossypium hirsutum.

The (beta)-gauge is a useful instrument for monitoring changes in plant water status, and it has also been used to estimate absolute water status. The effects of plant parameters such as variability of leaves, lateral leaf shrinkage, growth and ontogenetic changes, on the use of the technique for water status estimation in cotton (Gossypium hirsutum) were examined. It was concluded that the method has limited utility for the estimation of absolute plant water status. In conjunction, however, with a parallel sampling technique which was developed, the method can be of value for following both long and short term changes in water status.--Copyright 1974, Biological Abstracts, Inc.
W75-00529

7C. Evaluation, Processing and Publication

A STUDY OF THE EFFECTIVENESS OF WATER RESOURCES PLANNING GROUPS: A FINAL REPORT,
Utah State Univ., Logan. Center for Water Resources Research.
For primary bibliographic entry see Field 6A.
W75-00001

RESERVOIR SEDIMENTATION: A COMPUTER SIMULATION,
Kansas Water Resources Research Inst., Manhattan.
For primary bibliographic entry see Field 2J.
W75-00004

MULTIVARIATE TECHNIQUES FOR WATER QUALITY ANALYSIS,
Mississippi State Univ., State College. Dept. of Civil Engineering.
J. L. Mahlock.
Journal of the Environmental Engineering Division, American Society of Civil Engineers, Vol 100, No EE5, Proceedings paper No 10840, p 1119-1132, October 1974. 9 tab, 5 equ, 8 ref.

Descriptors: *Environmental engineering, *Water quality control, *Statistical methods, Regression analysis, Estimating, Data collections, Methodology, Information retrieval, Systems analysis, Equations.
Identifiers: *Multivariate analysis, Data matrix.

The application of multivariate statistical techniques to analysis of water quality data is demonstrated. Study results indicate that a simultaneous, multiple regression technique may be used for supplying missing observations and that at any particular level the entire data matrix may be considered, thus reducing the computational ef-

fort. Multivariate technique applications herein center on either extracting information from the data or testing hypotheses which may arise concerning the data. The techniques considered include principal components, canonical correlation, partial correlation, multivariate analysis of variance (MANOVA), and discriminant analysis. Examples are presented demonstrating the application of these methods. (Bell-Cornell)
W75-00022

THE USE OF A PROCESS COMPUTER IN AN ENVIRONMENTAL MONITORING SYSTEM,
Siemens und Halske A.G., Karlsruhe (West Germany). Measurement and Process Engineering Div.
For primary bibliographic entry see Field 5G.
W75-00111

AERIAL INFRARED THERMOGRAPHY IN THE SERVICE OF WATER PROTECTION: AN EXAMPLE: THE CASE OF CHARENTE (LA THERMOGRAPHIE INFRAROUGE AEROPORTEE AU SERVICE DE LA PROTECTION DES EAUX: UN EXEMPLE: LE CAS DE LA CHARENTE),
For primary bibliographic entry see Field 5A.
W75-00157

WATER RESOURCES OF THE KETTLE RIVER WATERSHED, EAST-CENTRAL MINNESOTA,
Geological Survey, Reston, Va.
J. O. Helgesen, G. F. Lindholm, W. L. Broussard, and D. W. Ericson.
For sale by USGS, 1200 S. Eads St., Arlington, Va. 22202. Price $1.75 per set. Geological Survey Hydrologic Investigations Atlas HA-437, 1973. 15 fig, 6 tab, 5 maps, 14 ref.

Descriptors: *Water resources, *Minnesota, *Maps, *Groundwater, *Surface waters, Lakes, Streams, Water wells, Aquifers, Alluvium, Glacial drift, Water yield, Water quality, Hydrologic data.
Identifiers: *Kettle River(Minn).

The water resources of the Kettle River watershed of Minnesota are discussed in a 4-sheet hydrologic atlas. About three-fourths of the annual precipitation falls during the growing season. Nevertheless, soil moisture is commonly insufficient for optimum plant growth during the summer. The average annual runoff from the watershed is about 9.5 inches. Most water percolating to the water table moves within local flow systems, being discharged in the watershed as streamflow or evapotranspiration. Yields of several hundred gallons per minute are possible from deep wells in the Hinckley and Fond du Lac Formations. Drift deposits, exceeding 100 feet in thickness, fill bedrock valleys in the southwestern part of the watershed and are possible sources of moderate to large groundwater supplies. In two areas, the surficial outwash may yield over 1,000 gallons per minute to a well. Ground water is generally suitable for domestic use and many industrial uses. The Kettle River and the major tributaries in the watershed provide an adequate supply of water suitable for most industrial, municipal, and agricultural uses. Streams draining outwash areas generally have the larger base-flow yields in the watershed. Annual minimum flows, in the larger streams usually occur late in the winter. Surface water in the Kettle River watershed has excellent mineral quality. The lakes, rivers, and streams are excellent habitat for fish, and wildlife, and provide good year-around recreational facilities. (Knapp-USGS)
W75-00217

WATER RESOURCES OF THE COTTONWOOD RIVER WATERSHED, SOUTHWESTERN MINNESOTA,
Geological Survey, Reston, Va.
W. L. Broussard, H. W. Anderson, Jr., and D. F. Farrell.
For sale by USGS, 1200 S. Eads St., Arlington, Va. 22202 Price $1.00 per set. Geological Survey Hydrologic Investigations Atlas HA-466, 1973. 3 sheets, 2 tab, 6 ref.

Descriptors: *Water resources, *Groundwater, *Surface waters, *Maps, *Minnesota, Water quality, Hydrologic data, Streamflow, Hydrogeology, River basins.
Identifiers: *Cottonwood River(Minn).

The water resources of the Cottonwood River watershed, Minnesota, are explained in a 3-sheet hydrologic atlas. Aquifers throughout the watershed serve two major functions in the hydraulic system; they are sources of water supplies, and they furnish a perennial base of streamflow by groundwater discharge. Water supplies are obtained from wells tapping Pleistocene glacial deposits, Cretaceous sandstone, Cambrian sandstone, and Precambrian crystalline rocks. The most accessible and widely used aquifers are beds of sand and gravel in the glacial deposits. Most of the Cottonwood River watershed is an area of groundwater recharge. Only part of the available groundwater has been developed, and no areas of significant groundwater decline are known. Average annual runoff from the watershed is about 3.0 inches. Most of the annual runoff occurs in spring and early summer. Sites for large storage reservoirs are limited to lower reaches of the rivers. Generally, the most uniform daily discharge occurs just prior to spring breakup and, in contrast, the least uniform occurs during the summer. Groundwater in the Cottonwood River watershed generally contains dissolved solids exceeding the U.S. Public Health Service recommended limit for drinking water (500 milligrams per liter). Most surface water also exceeds this limit during periods of low flow. Pollution of groundwater results mainly from excessive use of fertilizers and from recharge water that has passed through livestock feedlots. Surface water is also affected by these sources of pollution and by municipal and industrial waste. (Knapp-USGS)
W75-00218

WATER RESOURCES OF WISCONSIN, PECATONICA-SUGAR RIVER BASIN,
Geological Survey, Reston, Va.
S. M. Hindall, and E. L. Skinner.
For sale by USGS, 1200 S. Eads Street, Arlington, Va Price $1.75 per set. Geological Survey Hydrologic Investigations Atlas HA-453, 1973. 3 sheets, 47 ref.

Descriptors: *Water resources, *Surface waters, *Groundwater, *Wisconsin, Water yield, Hydrogeology, Maps, Water supply, Water levels, Hydrologic budget, Hydrologic data.
Identifiers: *Pecatonica River(Wisc), Sugar River(Wisc).

The physical environment, availability, characteristics, distribution, movement, and quality of water in the Pecatonica-Sugar River basin, Wisconsin are described in a 3-sheet hydrologic atlas. In addition, water use and water problems are summarized to give an understanding of man's management of water within the basin. Large amounts of good quality water are available in the Pecatonica-Sugar River basin. Of the 32.8 inches of average annual precipitation that falls on the basin, an average of 8.9 inches or 1,200 mgd runs off as streamflow. The quantity of surface water used in the study area greatly exceeds that of groundwater. Surface water is used for fuel-electric cooling (198 mgd), and for recreation, conservation, and waste transport. Groundwater is used for all municipal supplies, for most rural supplies, and for most industrial purposes. Groundwater is more widespread than surface water. It is available from three aquifers in the study area: the sandstone aquifer, the Galena-Platteville aquifer, and the sand and gravel aquifer. Any of these is capable of yielding domestic and stock supplies. The sandstone aquifer commonly yields more than 500 gpm to wells, and does the sand and gravel aquifer in the Mississippi River valley. All municipalities have adequate supplies of groundwater available for future growth and development. Water problems in the study area are minor and are related to water quality and flooding. Both groundwater and surface water have high natural hardness. High iron and nitrate concentrations are local problems in groundwater. Shallow aquifers, whether dolomite, sandstone, or glacial drift, are subject to local pollution. (Knapp-USGS)
W75-00219

DICTIONARY OF THE NATIONAL WATER QUALITY DATA BANK (NAQUADAT).
Department of the Environment, Ottawa (Ontario).
Canada Inland Waters Directorate Publication, 1973. 144 p.

Descriptors: *Canada, *Data storage and retrieval, *Data processing, *Hydrologic data, *Water quality, Data collections, Analytical techniques.

The computerized Canadian National Water Quality Data Bank (NAQUADAT) is designed to accept chemical, physical, bacteriological, biological, and hydrometric data relevant to water quality for surface waters, groundwaters, wastewaters, and sediments. The free format input and a station numbering system design to select specific sampling sites impart a high degree of flexibility to both input and retrieval. Data input to the system may be made from precoded laboratory forms, standard 80-character coding sheets, or magnetic tape from automated field or laboratory instruments. Data reports may be obtained in the form of lists, statistical summaries, plots, loadings, or cumulative mass flows. This dictionary is a separate computer file containing conversion factors for the various unit-of-measurement codes used in the system and information on each analytical test. (Knapp-USGS)
W75-00224

HYDROLOGIC DATA OF THE JUNE 1972 FLOOD IN PENNSYLVANIA,
Geological Survey, Harrisburg, Pa.
For primary bibliographic entry see Field 2E.
W75-00235

WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
For primary bibliographic entry see Field 4A.
W75-00241

LINEAR LEAST SQUARES PREDICTION FOR MULTIVARIATE TIME SERIES WITH MISSING OBSERVATIONS,
Geological Survey, Arlington, Va. Water Resources Div.
E. J. Gilroy.
In: Proceedings Symposium on Statistical Hydrology, held at Tucson, Arizona, August 31-September 2, 1971: Agricultural Research Service Miscellaneous Publication No 1275, p 78-83, June 1974. 8 ref.

Descriptors: *Statistical methods, *Time series analysis, Statistics, Data processing, *Least squares method, Data collections, *Hydrologic data, *Regression analysis.

If hydrologic data can be considered statistically independent over time, missing observations may be estimated by the methods of multivariate regression. However, in many instances the hypothesis of statistical independence of the data observed at different points in time is rejected. In these cases, the ordinary regression procedure for estimating the missing observations is not strictly applicable. The records at the different observa-

tion sites may then be considered to be incomplete samples from a multivariate time series. Under the assumption of weak stationarity of the time series, the technique of linear least square prediction theory may be applied. The fitting of various suitable models, such as autoregressive or moving average, leads to simplified estimates of the missing observations. (Knapp-USGS)
W75-00245

FLOOD ESTIMATION IN THE PRESENCE OF OUTLIERS,
Geological Survey, Reston, Va.
W. Kirby.
In: Proceedings Symposium on Statistical Hydrology, held at Tucson, Arizona, August 31-September 2, 1971: Agricultural Research Service Miscellaneous Publication No 1275, p 97-119, June 1974. 14 fig, 2 tab.

Descriptors: *Statistics, *Time series analysis, *Flood forecasting, Statistical methods, Flood data, Hydrologic data, Frequency analysis, Flood frequency.
Identifiers: *Outliers(Statistical).

Frequency analysis of flood discharge records often is complicated by the presence of outliers, which are observations which lie far above the other observations in the record. They are not spurious, but are so far out as to be considered extremely unlikely events. Inclusion of such outliers in the ordinary estimates of the mean, standard deviation, and other statistical parameters thus might badly distort these estimates. A weight function is given to minimize the mean square error (MSE) of the parameter being estimated. This analysis applies to a large class of parameters (including the population mean plus a specified number of standard deviations) and arbitrary sample sizes and underlying populations. The mean square error of the resulting weighted estimate is less than that of either of its constituent estimates. Even a crudely constructed weighted average of full-sample and censored-sample estimates is substantially more accurate than either of its constituent estimates when the sample contains a large outlier and is of equivalent accuracy when the sample does not contain an outlier. Therefore, such an estimator is routinely applicable to a larger class of samples than the ordinary full-sample estimate and should effect a significant reduction of the outlier problem. (Knapp-USGS)
W75-00246

OPTIMAL REAL-TIME CONTROL OF URBAN STORMWATER DRAINAGE,
Cornell Univ., Ithaca, N.Y. Dept. of Environmental Engineering.
For primary bibliographic entry see Field 6A.
W75-00261

COMPUTATIONAL ALGORITHMS FOR INTERACTIVE PATTERN RECOGNITION,
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
For primary bibliographic entry see Field 6A.
W75-00266

BIBLIOGRAPHY OF INTERACTIVE PATTERN RECOGNITION AND RELATED TOPICS,
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
For primary bibliographic entry see Field 6A.
W75-00267

GROUNDWATER BASIC DATA OF THE EDMONTON AREA (NORTHWEST SEGMENT), ALBERTA,
Research Council of Alberta, Edmonton.
R. Bibby.
Report 74-7, 1974. 42 p, 2 fig, 3 tab, 2 ref. $2.00.

Descriptors: *Groundwater resources, *Canada, *Water quality, *Aquifer characteristics, *Data processing, *Data storage and retrieval, Groundwater, Well data, Lithologic logs, Aquifer testing, Water levels, Chemical analysis.
Identifiers: *Edmonton(Alberta).

As part of a hydrogeological reconnaissance mapping program of the northwest segment of the Edmonton map area (NTS 83H), the basic data from the Central Data File at Alberta Research was abstracted and organized for use and stroage on a digital computer. Listings of this data made directly from the computer and arranged in three files were given: water level data, chemistry data, aquifer test data. (Gibb-ISWS)
W75-00318

ATLAS OF PHYSICAL AND CHEMICAL PROPERTIES OF PUGET SOUND AND ITS APPROACHES,
Washington, Univ., Seattle. Dept. of Oceanography.
For primary bibliographic entry see Field 2L.
W75-00375

PREDICTING THE CONDITIONAL PROBABILITY OF FROZEN PRECIPITATION,
National Weather Service, Silver Spring, Md.
For primary bibliographic entry see Field 2B.
W75-00490

SPLASH (SPECIAL PROGRAM TO LIST AMPLITUDES OF SURGES FROM HURRICANES). PART TWO. GENERAL TRACK AND VARIANT STORM CONDITIONS,
National Weather Service, Silver Spring, Md. Techniques Development Lab.
For primary bibliographic entry see Field 2B.
W75-00491

A DYNAMIC MODEL OF STAGE-DISCHARGE RELATIONS AFFECTED BY CHANGING DISCHARGE,
National Weather Service, Silver Spring, Md. Office of Hydrology.
For primary bibliographic entry see Field 4A.
W75-00493

INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES.
National Oceanic and Atmospheric Administration, Rockville, Md.
For primary bibliographic entry see Field 2H.
W75-00501

VARIABILITY OF HIGH PLAINS PRECIPITATION,
National Oceanic and Atmospheric Administration, Boulder, Colo. Atmospheric Physics and Chemistry Lab.
For primary bibliographic entry see Field 2B.
W75-00502

GREAT LAKES WATER LEVELS 1973. DAILY AND MONTHLY AVERAGE WATER SURFACE ELEVATIONS.
National Ocean Survey, Detroit, Mich. Lake Survey Center.
May 1974. 114 p, chiefly tables.

Descriptors: *Water levels, *Great Lakes, Lakes, *Data collections.
Identifiers: *Water surface elevations.

Lake Survey Center Great Lakes water level gage records are shown giving daily and monthly average levels for each gage in the network for the calendar year. The highest and lowest daily average are given for the month. A frequency distribution table of daily average levels shows the number of times each month the recorded levels were above a specified elevation. The gages record water levels in either an anolog or a digital form on strip charts which are retained for a period of ten years. Recorded hourly values were used to compute the daily averages and the monthly values were compiled from the daily averages. The diagram indicates the location of the recording water level gages. An index lists the gage location, identification number, and geographic co-ordinates. The stations are arranged by location and are in numerical order. (NOAA)
W75-00509

A STUDY OF TORNADO PROXIMITY DATA AND ON OBSERVATIONALLY DERIVED MODEL OF TORNADO GENESIS,
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
For primary bibliographic entry see Field 2B.
W75-00510

LAKE SUPERIOR BEGINNING-OF-MONTH WATER LEVELS AND MONTHLY RATES OF STORAGE CHANGES,
National Ocean Survey, Detroit, Mich. Lake Survey Center.
For primary bibliographic entry see Field 2H.
W75-00511

WORTH OF HYDROLOGIC DATA FOR SHORT-TERM FORECASTS OF FLOODS,
Arizona Univ., Tucson. Dept. of Hydrology and Water Resources.
For primary bibliographic entry see Field 2E.
W75-00515

FLOOD PLAIN INFORMATION: GLACIER CREEK, GIRDWOOD, ALASKA.
Army Engineer District, Anchorage, Alaska.
For primary bibliographic entry see Field 4A.
W75-00539

FLOOD PLAIN INFORMATION; CHATTAHOOCHEE RIVER, BUFORD DAM TO WHITESBURG, GEORGIA.
Army Engineer District, Mobile, Ala.
For primary bibliographic entry see Field 4A.
W75-00540

FLOOD PLAIN INFORMATION: NEABSCO CREEK AND COW BRANCH, PRINCE WILLIAM COUNTY, VIRGINIA,
Army Engineer District, Baltimore, Md.
For primary bibliographic entry see Field 4A.
W75-00542

FLOOD PLAIN INFORMATION: EAST BRANCH BRANDYWINE CREEK, (DOWNINGTOWN TO THE JUNCTION OF EAST AND WEST BRANCHES) CHESTER COUNTY, PENNSYLVANIA,
Army Engineer District, Philadelphia, Pa.
For primary bibliographic entry see Field 4A.
W75-00543

SPECIAL FLOOD HAZARD INFORMATION REPORT; COOSA RIVER-ETOWAH RIVER-OOSTANAULA RIVER, ROME, FLOYD COUNTY, GEORGIA,
Army Engineer District, Mobile, Ala.
For primary bibliographic entry see Field 4A.
W75-00544

FLOOD PLAIN INFORMATION: DE NEVEU CREEK, FOND DU LAC RIVER, MAIN STEM - EAST BRANCH - WEST BRANCH, FOND DU LAC COUNTY, WISCONSIN,
Army Engineer District, Chicago, Ill.
For primary bibliographic entry see Field 4A.

W75-00545

FLOOD PLAIN INFORMATION: PENNYPACK CREEK, (MEADOW BROOK, SOUTHHAMPTON CREEK, HUNTINGDON VALLEY CREEK, BLAIR MILL RUN) MONTGOMERY COUNTY, PA,
Army Engineer District, Philadelphia, Pa.
For primary bibliographic entry see Field 4A.
W75-00546

FLOOD PLAIN INFORMATION; SHEBOYGAN RIVER AND MULLET RIVER, SHEBOYGAN COUNTY, WISCONSIN.
Army Engineer District, Chicago, Ill.
For primary bibliographic entry see Field 4A.
W75-00547

FLOOD PLAIN INFORMATION, CUMBERLAND RIVER AND STRAIGHT CREEK, PINEVILLE, KENTUCKY.
Army Engineer District, Nashville, Tenn.
For primary bibliographic entry see Field 4A.
W75-00548

FLOOD PLAIN INFORMATION, LEMON CREEK, JUNEAU, ALASKA,
Army Engineer District, Juneau, Alaska.
For primary bibliographic entry see Field 4A.
W75-00549

FLOOD PLAIN INFORMATION: FARMINGTON BAY TRIBUTARIES, FARMINGTON-CENTERVILLE, UTAH,
Army Engineer District, Sacramento, Calif.
For primary bibliographic entry see Field 4A.
W75-00550

8. ENGINEERING WORKS

8A. Structures

DESIGN OF BASIN COLLECTION TROUGHS,
Envirex, Inc., Waukesha, Wis.
W. H. Boyle.
Water and Sewage Works, p 136-137, April 30, 1974.

Descriptors: *Economics, *Design criteria, *Conduits, *Treatment facilities, Flooding, Weirs, Mathematical studies, Flow rates.

Collection troughs have a direct bearing on both the process and the economic aspects of a facility. The process aspect of collection troughs involves the requirement to handle a maximum specific flow rate. They must be sized properly so the hydraulics of the troughs will not adversely affect the intended unit process design and must be designed properly so that flooding of the weirs does not occur. Another important aspect of the design of the collection trough would be that of economics. A proper economic sizing of the trough should be a compromise between an economic determination of the cost of the trough, versus the cost of handling additional headloss. Finally, it is important for the design engineer to determine if the collection trough will have free or submerged discharge, and size accordingly. (Sandoski-FIRL)
W75-00125

TULE CREEK DAM,
J. Ehly.
Water and Sewage Works, p 130, April 30, 1974.

Descriptors: *Dams, Construction materials, Construction costs, *Texas, Dam foundations, Damsites, Dam design, Dam construction.
Identifiers: *Tule Creek(Tex).

A $2.6 million non-federal aid dam on Tule Creek in Texas is nearing completion. A 35-foot wide core of Tule clay which is impervious to water rising from a depth of 25 feet below the canyon floor will extend through the center to the top of the dam across its full length. A 30-inch pipe encased in concrete will be the service outlet. Stabilized soil will provide slope protection on the upstream side. The downstream side of the dam will have 14 acres of Bermuda grass seeding and a sprinkler system. (Sandoski-FIRL)
W75-00137

SANITARY DRAINAGE SYSTEM,
Carlson (Andrew) and Sons, Inc., Kings Park, N.Y. (assignee).
For primary bibliographic entry see Field 5D.
W75-00169

I C E VISITS EDINBURGH'S (POUNDS) 22M TUNNELLED SEWER SYSTEM,
For primary bibliographic entry see Field 5D.
W75-00183

ATCHAFALAYA RIVER AND BAYOUS, CHENE, BOEUF, AND BLACK, LOUISIANA (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, New Orleans, La.
For primary bibliographic entry see Field 4A.
W75-00293

OPERATION OF COUGAR LAKE PROJECT AND CONSTRUCTION OF MCKENZIE RIVER SALMON HATCHERY, MCKENZIE RIVER BASIN, LANE COUNTY, OREGON (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, Portland, Oreg.
For primary bibliographic entry see Field 4A.
W75-00294

NORTH SIDE COLLECTION SYSTEM FRYINGPAN-ARKANSAS PROJECT, COLORADO (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Bureau of Reclamation, Denver, Colo.
Available from the National Technical Information Service, Springfield, Va. 22161 as EIS-CO-73-1216-F, $9.25 in paper copy, $2.25 microfiche. July 23, 1973. 311 p, 30 fig, 8 tab.

Descriptors: *Environmental effects, *Inter-basin transfers, *Diversion structures, *Colorado, *Federal government, Water management(Applied), Water utilization, Colorado River Basin, River basin development, Diversion, Diversion dams, Governmental interrelations, Streamflow, Conduits, Engineering structures, Flood control, Water supply development, Water resources development, Water yield improvement, Multiple-purpose projects, Surface runoff, Water conveyance, Watershed management, Water transfer, Colorado River Aqueduct.
Identifiers: *Environmental Impact Statements, *National Environmental Policy Act, *White River National Forest(Colo).

The North Side Collection System is a major feature of the Fryingpan-Arkansas Project and is located within the White River National Forest in Colorado. It consists of an arrangement of diversion dams, conduits and tunnels designed to intercept and transport runoff from tributaries of the Fryingpan River. The system will be operated in accordance with established minimum bypasses to protect stream values. Construction began in 1970 and is scheduled for completion in 1977. Objectives of the project are to provide for municipal and industrial water supplies, supplemental irrigation water, hydroelectric power, flood control, recreation, and conservation and development of fish and wildlife. This system will divert an average 18,400 acre-feet of water annually from the Colorado River Basin to the Arkansas River Basin, thereby slightly increasing the salinity of the Colorado River and improving water quality in the Arkansas River. The result will have both positive and negative influences upon the aquatic ecosystem. Cancellation of the North Side project and a pumping system were rejected in favor of modifications to the present system. There is no significant opposition to completion of this project. (Deckert-Florida)
W75-00299

IMPINGING CIRCULAR TURBULENT JETS,
Alberta Univ., Edmonton. Dept. of Civil Engineering.
S. Beltaos, and N. Rajaratnam.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings paper 10852, p 1313-1328, October 1974. 15 fig, 1 tab, 18 ref, 3 append.

Descriptors: *Hydraulics, *Jets, *Shear stress, *Turbulent flow, Dimensional analysis, Turbulence, Water pressure, Flow, Analytical techniques, Pressure, Walls.
Identifiers: *Impinging circular jets, *Similitude, Impingement.

The normal impingement of turbulent circular jets on smooth walls was studied both experimentally and analytically. This type of flow can be divided into three distinct flow regions: the free-jet region; the impingement region; and the wall-jet region. The impingement region is the most important; it occupied about 14% of the impingement height above the wall. Semi-empirical methods to predict axial variations of velocity and static pressure were developed. Similarity of velocity and static pressure profiles was investigated and it was shown that these profiles were well described by the Gaussian error function. Variations of pertinent length scales were obtained empirically using dimensional analysis so that the time-averaged velocity and pressure fields in the impingement region could be predicted. A method to predict the wall shear stress in the impingement region was developed. (Singh-ISWS)
W75-00316

PERMITS FOR CONSTRUCTION OF SHORE PROTECTION WORKS ON LAKE MICHIGAN.
Wisconsin Univ., Madison. Sea Grant Program.
For primary bibliographic entry see Field 2H.
W75-00383

MORGAN CITY, LOUISIANA, AND VICINITY (FINAL ENVIRONMENTAL STATEMENT).
Army Engineer District, New Orleans, La.
Available from the National Technical Information Service, Springfield, Va. 22161 as EIS-LA-73-0989-F; $4.25 in paper copy, $2.25 in microfiche. January 1973. 51 p, 5 fig, 3 append.

Descriptors: *Louisiana, *Hurricane, *Check structures, *Levee, *Drainage systems, *Flood protection, Flood damage, Civil engineering, Social aspects, Flood control, Economic aspects, Decision making, Cost-benefit analysis, Environmental effects, Engineering structures, Conduits, Pipes, Pumping plants, Federal government, Water conveyance, Economic justification, Project planning, Psychological aspects, Social impact, Direct benefits, Direct costs, Research and development, Conservation.
Identifiers: *Environmental impact statement, *Morgan City(La).

The proposed project is an improved levee system and it is suggested that this is the most economical and environmentally sound means for providing hurricane flooding protection. Present information indicates that the project will exert only nominal impact on the natural environment, and these impacts will be limited to immediate construction sites. The social well being of the 20,000 people

living in a 35,000 acre area will be enhanced by the removal of the threat of hurricane flooding. From an engineering standpoint, the plan as proposed is the most feasible method of providing the required protection. An analysis of the economic trends of growth and development of the area to be protected indicate that the projected rate of development of residential, industrial, commercial, and recreational areas will not be significantly altered by construction of the project. The probable adverse effects are insignificant and would not be avoided by following reasonable alternative courses of action. Twenty-one miles of levee will be enlarged and three and a half miles of new levee will be built. Numerous pipeline crossings will be relocated. Existing pumping stations will be modified as will other drainage structures. (Sperling-Florida)
W75-00474

MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI, VOL I-II (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, St. Louis, Mo.
Available from National Technical Information Service, Springfield, Va. 22161 as EIS-MO-73-1552-F-1-2. September 27, 1973. 1028 p, 60 fig, 160 tab, 13 append.

Descriptors: *Environmental effects, *Dam construction, *Reservoir construction, *Missouri, *Flooding, Dams, Water management(Applied), Rivers, Water resources development, Recreation facilities, Planning, Mississippi River Basin, Federal government, Governmental interrelations, River basin development, Multiple-purpose projects, Impoundments, Reservoirs, Flood protection, Flood control, Engineering structures, Rockfill dams, Damsites, Water supply.
Identifiers: *Environmental impact statement, *St. Louis(Mo), *Dam effects.

This project involves construction of an earth and rock-fill dam on the Meramec River, 108 miles above the confluence of the Meramec and Mississippi River, thereby creating a multiple-purpose reservoir with a normal pool of 12,600 acres. The primary purpose of this project is to meet the flood control and water-based recreation needs of the Meramec Valley and St. Louis metropolitan area. Low flow augmentation of the lower river for water quality control and conservation of downstream fishery will also benefit navigation on the Mississippi River. The project will result in inundation of 12,000 acres of highly productive terrestrial wildlife habitat, including habitat for several rare and endangered species; 75 miles of natural streams and riparian wildlife habitat; 86 known archeological sites; as many as 44 natural caves and several esthetically unique limestone bluffs. Alternate reservoir sites and flood protection measures were considered. However, the proposed project is deemed the only feasible alternative. There is significant environmental opposition to the project, including a federal court action filed by the Sierra Club. (Deckert-Florida)
W75-00478

8B. Hydraulics

MATHEMATICAL MODELS OF WIND INDUCED CIRCULATION IN A LAKE,
Lund Inst. of Tech. (Sweden).
For primary bibliographic entry see Field 2H.
W75-00071

HORIZONTAL DIFFUSION IN LAKE CURRENTS,
Canada Centre for Inland Waters, Burlington (Ontario).
For primary bibliographic entry see Field 2H.
W75-00073

THE TURBULENT REGIME OF A SHALLOW RESERVOIR,
Main Geophysical Observatory, Leningrad (USSR).
For primary bibliographic entry see Field 2H.
W75-00075

HYDRAULIC MODEL STUDY OF SEDIMENT MOVEMENT AND CHANGES IN THE BED CONFIGURATION OF A SHALLOW LAKE,
Research Inst. of Water Resources Development, Budapest (Hungary).
For primary bibliographic entry see Field 2J.
W75-00084

THE SHORE DYNAMICS OF A MOUNTAIN PLAIN RESERVOIR OF THE AZERBAIJAN SSR,
Akademiya Nauk Azerbaidzhanskoi SSR, Baku. Institut Geografii.
For primary bibliographic entry see Field 2J.
W75-00085

HYDRAULIC PERFORMANCE OF BRIDGES, EFFICIENCY OF EARTHEN SPUR DIKES IN MISSISSIPPI,
Geological Survey, Washington, D.C.
B. E. Colson, and K. V. Wilson.
Available from the National Technical Information Service, Springfield, Va 22161 as PB-230 995, $3.75 in paper copy, $2.25 in microfiche. Report No MSHD-RD-73-15-SD, February, 1974. 33 p, 18 fig, 2 ref.

Descriptors: *Dikes, *Scour, *Eddies, *Flow around objects, *Abutments flow rate, Backwater, Uniform flow, Running waters, *Mississippi.
Identifiers: *Spur dikes.

Properly constructed earthen spur dikes change the location of potential scour from near bridge abutments to the upstream end of the dikes where scour no long endangers the bridge abutments. Spur dikes create more uniform flow velocities and reduce eddies near bridge abutments. The size of eddies appears to be related to the ratio of the side flow to the flow approaching the bridge. Overtopping of spur dikes by floodwaters causes them to become less effective. In Mississippi, spur dikes commonly increase backwater. (FHA)
W75-00103

KANSAS STREAMFLOW CHARACTERISTICS: PART 10. SELECTED STREAMFLOW CHARACTERISTICS AS RELATED TO ACTIVE-CHANNEL GEOMETRY OF STREAMS IN KANSAS,
Geological Survey, Lawrence, Kans.
For primary bibliographic entry see Field 2E.
W75-00227

SALINITY PROBLEMS OF ORGANISMS IN COASTAL AREAS SUBJECT TO THE EFFECT OF ENGINEERING WORKS,
Gulf Coast Research Lab., Ocean Springs, Miss.
For primary bibliographic entry see Field 5C.
W75-00240

APPLICATION OF SENSITIVITY ANALYSIS TO RESERVOIR DESIGN AND WORTH OF STREAMFLOW DATA,
Geological Survey, Fort Collins, Colo.
M. E. Moss, and D. R. Dawdy.
In: Proceedings Symposium on Statistical Hydrology, held at Tucson, Arizona, August 31-September 2, 1971: Agricultural Research Service Miscellaneous Publication No 1275, p 16-25, June 1974. 6 fig, 3 tab, 10 ref.

Descriptors: *Reservoir design, *Statistical methods, *Data collections, *Stochastic processes, Regression analysis, Water yield, Statistical models, Water demand, Estimating, Mathematical models.
Identifiers: *Sensitivity analysis.

The effects of four nonhydrometric variables upon the expected net benefit of a multipurpose reservoir and upon the worth of streamflow data used in the design of the reservoir were investigated by sensitivity analysis. The four variables are cyclincity in water demand, flood-pool-operation policy, errors in evaporation data, and methodology used in designing the reservoir. Valuation of the level of information available without streamflow records at the reservoir site was included as an inherent step in the analysis. This valuation was performed by means of a stochastic streamflow sequence for which monthly statistics were estimated from multiple regression models. Stochastic sequences of streamflow were used to minimize the complications introduced by sampling errors if actual sequences had been used. Analyses of the sensitivity of worth of data were used to define those parameters derived from the above variables that must be taken into account in relations that generalize worth of streamflow data. (Knapp-USGS)
W75-00244

EXPERIMENTAL STUDY OF THE EFFECT OF SALTATION LOAD ON FLOW KINEMATICS,
Akademiya Nauk SSSR, Moscow. Institut Vodnykh Problem.
For primary bibliographic entry see Field 2J.
W75-00314

SPILLWAY DESIGN FOR SERIES OF RESERVOIRS,
Pacific Gas and Electric Co., San Francisco, Calif.
C. B. Cecilio, B. A. Kraeger, and V. Yucel.
Journal of the Hydraulics Division, American Society of Civil Engineers, Vol 100, No HY10, Proceedings Paper 10851, p 1329-1342, October 1974. 10 fig, 3 tab, 14 ref, append.

Descriptors: *Hydraulics, *Maximum probable flood, *Model studies, *Design flow, *Spillways, *Probable maximum precipitation, *Simulation analysis, Hydrology, Reservoirs, Dams, Drainage area, Precipitation(Atmospheric), Meteorology, Watersheds(Basins), *California.
Identifiers: Hydrocomp simulation program, *North Fork Feather River(Calif).

For a system of multiple reservoirs on a single river, it is important to design the spillway capacities of the dams under prototype conditions reflecting their interaction in major storm events. A methodology for examining design spillway floods for such a series of dams was outlined using existing meteorologic and hydrologic data in continuous watershed modeling. Initially, a large complex watershed was subdivided into homogeneous hydrometeorologic subwatersheds where model parameters could be determined for each such subwatershed. Using continuous observed hourly precipitation, streamflow throughout the watershed was simulated and compared to the observed streamflow records. When a good comparison between recorded and simulated flow was achieved, the model was calibrated. The precipitation event studied was the Probable Maximum Precipitation as defined by the National Weather Service. The study watershed, North Fork Feather River above Oroville, contained 11 reservoirs. It was shown that outflows from these reservoirs for design storms were affected by initial moisture conditions, temperature (mostly because of increased snowmelt), depth of snow cover, and initial soil moisture conditions. (Singh-ISWS)
W75-00315

IMPINGING CIRCULAR TURBULENT JETS,
Alberta Univ., Edmonton. Dept. of Civil Engineering.
For primary bibliographic entry see Field 8A.

W75-00316

HYDRAULICS OF FLOW IN ROUGH CHANNEL,
Indian Agricultural Research Inst., New Delhi. Div. of Agricultural Engineering.
A. K. Bhattacharya.
Indian Journal of Technology, Vol 11, No 1, p 6-9, January 1973. 6 fig, 3 tab, 2 ref.

Descriptors: *Concrete-lined canals, *Mannings equation, *Roughness coefficient, *Hydraulics, Irrigation canals, Regression analysis, Froude number, Subcritical flow, Supercritical flow, Turbulent flow, Laboratory tests.
Identifiers: *Rough channel, *Tilting flume, Hydraulic depth.

Flow behavior in a concrete channel built up from precast channels made from cement sand coarse aggregates and joined end to end by cement plaster was studied under different discharge and slope conditions on a tilting frame. It was found that Manning's roughness coefficient was significantly correlated to Froude number in both subcritical and supercritical states of flow. In all cases the value of the roughness coefficient decreased with an increase in the value of Froude number. Linear regression analyses were done and equations of lines of regression were developed. These equations may be utilized in designing concrete lined irrigation canals for different slopes. (Bhowmik-ISWS)
W75-00319

INVARIANT IMBEDDING AND UNSTEADY GROUND-WATER FLOW,
California Univ., Los Angeles. Dept. of Engineering Systems.
For primary bibliographic entry see Field 2F.
W75-00334

1974 FLOATING BREAKWATERS CONFERENCE PAPERS.
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
T. Kowalski (Ed.) Rhode Island University, Marine Technical Report Series Number 24, 1974. 302 p, numerous fig and ref. Papers presented at Floating Breakwaters Conference held in Newport, Rhode Island, April 23-25, 1974, and co-sponsored by the University of Rhode Island and the University of Washington. 04-3-158-3.

Descriptors: *Shore protection, *Breakwaters, *Coastal structures, *Engineering structures, *Construction materials, *Harbors, *Marinas, Storms, Beach erosion, Bibliographies.
Identifiers: *Floating breakwater, Wave attenuation, Wind-generated waves, Scrap tires, Sea Grant Program.

A collection of the 18 papers presented at the Floating Breakwater Conference held in Newport Rhode Island, April 23-25, 1974 is presented. Titles included are: Floating Breakwaters--State of the Art; Theoretical Analysis of Floating Breakwater Performance; The Effect of Surge, Heave and Pitch on the Performance of a Floating Breakwater; Tethered Float Breakwaters; The Performance of an Offset Breakwater Configuration in Wind-generated Waves; A Wave Barrier Concept; Development of Hermaphrodite Breakwater Units Utilizing Hydrofoils in Specific Arrangement; Attenuation of Wind-generated Deep Water Waves by Pneumatic and Hydraulic Breakwaters; Prototype Performance Characteristics of a Floating Breakwater; The 'Seabreaker' Floating Breakwater; Goodyear Scrap Tire Floating Breakwater Concepts; The Harris Floating Breakwater; Scrap Tire Floating Breakwater; Materials and Construction Techniques for Floating Breakwaters; Practical Applications of Floating Breakwaters for Small Craft Harbors; Workshop I: Future Uses of Floating Breakwaters; Workshop II: Floating Breakwaters for Small Boat Marinas; and A Chronological Survey of the Literature on Transportable and Floating Breakwaters. (See also W75-00405 thru W75-00422) (NOAA)
W75-00404

FLOATING BREAKWATERS--STATE OF THE ART,
Washington Univ., Seattle. Dept. of Civil Engineering.
E. P. Richey, and R. E. Nece.
Rhode Island University, Marine Technical Report Series Number 24, 1974. p 1-19, 10 fig, 36 ref. Paper presented at Floating Breakwaters Conference held in Newport, Rhode Island, April 23-25, 1974, and co-sponsored by the University of Rhode Island and the University of Washington.

Descriptors: *Breakwaters, *Engineering structures, *Coastal structures, *Construction materials, *Harbors, *Marinas, *Shore protection, Beach erosion.
Identifiers: *Floating breakwaters, Incident waves, Wave attenuation, State of the Art.

This is an updating of an earlier presentation under the same title at the Second Annual Technical Conference on Estuaries of the Pacific Northwest, March 1972, Corvalis, Oregon. Another paper with an overlapping thrust, 'Recent Designs for a Transportable Wave Barriers and Breakwaters' by Owen M. Griffin, appeared simultaneously in the Marine Technology Society Journal, March-April 1972. The authors of these two papers were not aware of each other's work, prior to publication and approached the topic from somewhat different perspectives, so that the combination of the two papers represents a rather complete assessment of breakwater art as of 1972. This 1972 paper realigns the earlier one to consider the significant intervening developments in breakwater forms, analyses, and field tests. Many of these developments appear as individual papers in the Proceedings of the Floating Breakwater Conference, so only brief reference to them need be made. Furthermore, an extensive bibliography, ordinarily a vital ingredient of any state of the art paper, has been omitted, since one has been included separately in the Proceedings. (See also W75-00404) (NOAA)
W75-00405

THEORETICAL ANALYSIS OF FLOATING BREAKWATER PERFORMANCE,
Washington Univ., Seattle. Dept. of Mechanical Engineering.
B. H. Adee, and W. Martin.
Rhode Island University Marine Technical Report Series Number 24, p 21-39, 1974. 9 fig, 16 ref. Presented at Floating Breakwaters Conference held in Newport, Rhode Island, April 23-25, 1974. 61-8170.

Descriptors: *Breakwaters, *Engineering structures, *Barriers, *Coastal structures, *Harbors, *Shore protection, Models, Hydraulic structures.
Identifiers: *Floating breakwaters, *Boundary-value problems, Incident waves, Sea Grant Program.

The problem of computing the response of a floating-breakwater system acted upon by incident waves is considered. A theoretical, linear model is developed based on the assumptions of deep water, an inviscid fluid, irrotational fluid flow, small incident waves and small breakwater motions. The breakwater is assumed to be long and uniform in the direction parallel to the incident wave crests. These assumptions permit the formulation of a set of coupled, linear, second-order differential equations for the breakwater sway, heave and roll motions. The solutions to four similar boundary-value problems for the velocity potential permit the computation of the exciting forces and hydrodynamic coefficients required in the equations of motion. The diffracted and breakwater-motion generated wave fields are obtained from the solution of the boundary-value problems. Computer-calculated breakwater system response is compared with experimentally obtained data for a breakwater of rectangular cross section. Although there are some discrepancies, the theoretical model provides reasonable predictions of the transmitted waves and breakwater motions. (See also W75-00404) (NOAA)
W75-00406

THE EFFECT OF SURGE, HEAVE AND PITCH ON THE PERFORMANCE OF A FLOATING BREAKWATER,
Continental Oil Co., Houston, Tex.
A. A. Sutko, and E. L. Haden.
Rhode Island University Marine Technical Report Series Number 24, p 41-53, 1974. 15 fig, 6 ref. Presented at Floating Breakwaters Conference held in Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Engineering structures, *Barriers, *Coastal structures, *Harbors, *Shore protection, Surges, Hydraulic structures.
Identifiers: Wave transmission, Energy transmission, Wave reflection.

Laboratory work concerning the effect of breakwater and wave variables on the performance of a floating breakwater was reported at the 1973 Offshore Technology Conference. This paper describes an extension of that work and centers on the relative effects of breakwater surge, heave, and pitch. Primary emphasis is on the way these motions affect wave transmission, wave reflection, and energy dissipation. Experimental work was carried out in the Continental Oil Company laboratory wave tank. The results show that surge is the primary cause of wave transmission. Heave and pitch are much less involved. these conclusions are based primarily on tests where only one motion was allowed, but they are reinforced by the 'two' motion tests. The primary reason for the undesirable effect of surge appears to lie in the decreased energy dissipation when this motion is present. There is also a lesser influence due to slightly decreased wave reflection. The importance of breakwater motion is further emphasized in those tests in which it is restricted to pitch or heave. In these cases, there is less total energy transmitted than is originally contained in the oncoming wave below the base of the breakwater. (See also W75-00404) (NOAA)
W75-00407

TETHERED FLOAT BREAKWATERS,
Scripps Institution of Oceanography, La Jolla, Calif.
R. J. Seymour, and J. D. Isaacs.
Rhode Island University Marine Technical Report Series Number 24, p 55-72, 1974. 10 fig, 3 ref. Presented at Floating Breakwaters Conference held in Newport, Rhode Island, April 23-25, 1974. 04-3-158-22.

Descriptors: *Breakwaters, *Barriers, *Harbors, *Marinas, *Engineering structures, Coastal structures, *Hydraulic structures.
Identifiers: *Floating breakwaters, *Offshore terminals.

The tethered float breakwater is constructed of a large number of very buoyant floats with a characteristic dimension about equal to the wave height. They are independently tethered below the surface in a water depth many times the float diameter. The floats are driven in opposition to the waves by the pressure gradient field and the dominant attenuation mechanism is drag from the resultant buoy motion. A mathematical model has been derived to predict the attenuation of a particular array configuration on a given incident wave spectrum. This theoretical model has been verified at laboratory scale and its essential features verified at ocean scale. Performance predictions are shown for a wide range of design conditions. The breakwater system appears attractive for deep water ap-

plications and can be constructed in water of any depth greater than some minimum. Potential applications include harbor and marina protection and offshore terminals. A mechanism for low cost and flexible beach erosion control employing this system is suggested. (See also W75-00404) (NOAA)
W75-00408

THE PERFORMANCE OF AN OFFSET BREAKWATER CONFIGURATION IN WIND-GENERATED WAVES,
Gilbert Associates, Inc., Reading, Pa.; Exxon International Co., New York.; and Texas Univ., Austin.
E. D. Sethness, Jr., W. L. Moore, and D. Sabathier.
Rhode Island University Marine Technical Report Series Number 24, p 73-90, 1974. 14 fig, 10 ref. Presented at Floating Breakwaters Conference held in Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Barriers, *Harbors, *Engineering structures, *Coastal structures, *Hydraulic structures, Model studies.
Identifiers: *Floating breakwaters, *Wind generated waves.

A brief discussion is given of the need for floating breakwaters and of previous studies. Two configurations for a breakwater are then considered, first, a continuous rigid vertical wall, and second, a segmented rigid vertical wall with alternate segments offset a distance equal to one-half of the incident wave length. With the offset configuration the wave forces on alternate segments tend to oppose each other giving less net force on the offset wall than for a continuous wall. A simple analysis leads to equations and diagrams representing the forces for each configuration. A model of an offset configuration floating breakwater was tested in both regular mechanically generated waves and in wind generated waves. Experimentally measured wave transmission coefficients are compared with those for a continuous rigid wall and for other types of floating breakwater. The potential of the offset floating breakwater is considered. (See also W75-00404) (NOAA)
W75-00409

A WAVE BARRIER CONCEPT,
Connecticut Univ., Storrs. Dept. of Mechanical Engineering.
W. W. Bowley.
Rhode Island University Marine Technical Report Series No. 24, p 91-112, 1974. 18 fig, 18 ref. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974. ILD-BWB-84A-16.9.

Descriptors: *Breakwaters, *Barriers, *Engineering structures, *Coastal structures, *Hydraulic structures, Model studies, Harbors.
Identifiers: *Floating breakwaters, Wave barriers.

This paper traces the design, development, and subsequent experimental verification of the Bowley wave barrier. The wave barrier consists of modular units which can be set into various arrays to form a substantial system capable of attenuating waves of varying heights and lengths. Sufficient data is presented to substantiate the flexibility of the system as well as the resultant performance in terms of the transmission coefficient. The work accomplished to date seems to indicate a very strong need for establishing a figure of merit that is of sufficient generality to allow an evaluation of the numerous floating breakwaters existing and contemplated. There is also a need for a site engineering computer program which will allow theoretical emplacement evaluations to be made without the need for costly enactment on a full scale. (See also W75-00404) (NOAA)
W75-00410

DEVELOPMENT OF HERMAPHRODITE BREAKWATER UNITS UTILIZING HYDROFOILS IN SPECIFIC ARRANGEMENTS,
Delaware Univ., Newark. Dept. of Civil Engineering.
K. P. H. Frey.
Rhode Island University Marine Technical Report Series, No 24, p 113-129, 1974. 22 fig, 1 tab, 6 ref. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Model studies, *Pollution abatement, *Oil pollution, *Oil spills, *Coastal structures, *Hyraulic structures, *Engineering structures, Hydrofoils.
Identifiers: *Floating breakwaters, Airfoils, Hermaphrodite breakwaters, Wave attenuation.

The present studies have continued explorations on whether there are merits in using basic airfoil or hydrofoil research in the field of floating breakwaters. Previous tests have been extended in this study to provide a broader basis for judgment of breakwater units of discontinuous surface; emphasis has been to the significance of the thickness ratio (h/c) of sections. The most interesting result seems to occur when two types of units with a discontinuous surface and with a continuous surface are combined. Beach-like inclinations with the leading edge lower than the trailing edge were generally most effective in these tests. A composite breakwater with a discontinuous surface and a unit of continuous surface should be adjusted so that the discontinuous portion achieves a substantial amount of the total expected wave attenuation, where this is physically feasible and needed. The continuous portion of the breakwater achieves the final reasonable high attenuation of waves in a way which reduces the chance that pollution spills in the upper water layers can expand beyond the device. Hence, a special kind of hermaphrodite device is suggested. (See also W75-00404) (NOAA)
W75-00411

ATTENUATION OF WIND-GENERATED DEEP WATER WAVES BY PNEUMATIC AND HYDRAULIC BREAKWATERS,
Massachusetts Univ., Amherst. Dept. of Civil Engineering.; and Stone and Webster Engineering Corp., Boston, Mass. Hydroelectric Div.
J. M. Colonell, C. E. Carver, Jr., and J. M. Lacouture.
Rhode Island University Marine Technical Report Series No. 24, p 131-158, 1974. 18 fig, 2 tab, 20 ref. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974. N00014-68-A-0146, N00014-68-A-0146-9, NR 200-016.

Descriptors: *Breakwaters, *Barriers, *Engineering structures, *Coastal structures, *Hydraulic structures, Waves(Water), Ocean waves, Model studies.
Identifiers: *Hydraulic breakwaters, *Pneumatic breakwaters, *Wind-generated waves, Low-pass filters, Wave attenuation.

Objectives of this investigation were: (1) To determine the operational characteristics of two devices--one hydraulic and the other pneumatic--in a wind-generated wave environment, and (2) To develop insight into the physical mechanism by which waves are attenuated by these devices. The breakwater devices were tested separately and also in tandem configurations. Data collection included power input to the breakwaters, continuous water surface profiles on both sides of the breakwaters, and current velocity profiles produced by each device. Data analysis yielded wave statistics and energy spectra which were employed in the evaluation of breakwater performance. Results show that the pneumatic breakwater is slightly more effective for attenuating deep water waves than the hydraulic breakwater under the same operating conditions. Both breakwater devices tend to act as low-pass filters to a train of wind-generated waves. Tandem operations proved less efficient than either device operating alone. (See also W75-00404) (NOAA)
W75-00412

PROTOTYPE PERFORMANCE CHARACTERISTICS OF A FLOATING BREAKWATER,
Washington Univ., Seattle. Dept. of Civil Engineering.
D. R. Christensen, and E. P. Richey.
Rhode Island University Marine Technical Report Series No. 24, p 159-179, 1974. 20 fig, 6 ref. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Harbors, Engineering structures, *Coastal structures, *Hydraulic structures, *Alaska, Storms.
Identifiers: *Floating breakwaters, Wave effects, Sea Grant Program.

The characteristics, i.e., transmission coefficients, anchor forces, and accelerations in heave, roll, and sway are evaluated from measurements taken on a floating breakwater protecting a small boat harbor at Tenakee Springs, Alaska. The breakwater consists of series-connected modules of lightweight, post-tensioned, styrofoam filled concrete. The modules, in planform, are 21 ft x 60 ft open rectangles with a three foot perimeter and draft about 3 ft of their 5-ft vertical dimension. The field measurements were planned with the combined purpose of evaluating a particular type of breakwater under different wave exposures and to supply basic data for the verification and development of a theoretical predicitive model for breakwater performance. The instrumentation was designed with multiple-channel, digital recording capability and packaged for use in remote locations, requiring only periodical maintenance checks and tape changes. The system can be set to be actuated at a selected wind speed and to sample the various input sensors at prescribed intervals and durations of time. (See also W75-00404) (NOAA)
W75-00413

THE 'SEABREAKER' FLOATING BREAKWATER,
National Research Development Corp., London (England).
H. G. Haslet.
Rhode Island University Marine Technical Report Series No. 24, p 181-191, 1974. 4 fig. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Engineering structures, *Coastal structures, *Harbors, *Hydraulic structures, Swell.
Identifiers: *Floating breakwaters, *Seabreakers, *Wind-generated waves, Design wave, Wave attenuation.

The concept of using a long, stiff horizontal surface for wave attenuation evolved during flume tests in 1963. Each unit is a long, rigid pontoon of specialized design, with a universal joint at either end enabling a string of units to be joined together. It may be used in four different ways: permanently moored, temporarily moored, crawling, or full mobile. Possible uses are discussed, together with the practical problems that have been faced. Advantages of the design include shallow draft, light weight, modest mooring loads even in strong currents, ease of towing or self-propulsion, ability to take the ground or be winched up a beach, seaworthiness under overload conditions, and provision for catwalk, daymarks, lights, and refuge. Over 60% attenuation of wave height is claimed in wind-driven waves or steep swell, up to the size of the Design Wave for that particular unit. (See also W75-00404) (NOAA)
W75-00414

GOODYEAR SCRAP TIRE FLOATING BREAKWATER CONCEPTS,
Goodyear Tire and Rubber Co., Akron, Ohio. Research Div.
R. D. Candle.
Rhode Island University Marine Technical Report Series No. 24, p 193-211, 1974. 5 fig. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Barriers, *Construction materials, *Engineering structures, *Coastal structures.
Identifiers: *Floating breakwaters, Scrap tires, Energy absorption, Breakwater construction, Tires.

Scrap tires are proposed as a construction material for bulding large floating breakwater devices. The Goodyear scrap tire floating breakwater assemblies are formed by securing together modular bundles of tightly interlocked scrap tires with high strength rope or cable. This construction procedure yields and easily installed, readily adaptable breakwater structure which has high energy absorbing capacity for normal loading conditions, but which deforms and yields when subjected to overloads. The design possibilities using scrap tire building modules are virtually limitless. All scrap tire breakwater constructions should be very effective as energy dissipators because of the pervious, and flexible nature of the modules. The scrap tires are ideal energy-absorbing components. They are inexpensive and nearly non-destructable. The utilization of this proposed concept will significantly advance the art of breakwater design and construction. (See also W75-00404) (NOAA)
W75-00415

THE HARRIS FLOATING BREAKWATER,
Harris and Sutherland, London (England); and Taylor Woodrow International Ltd., London (England).
A. J. Harris, and J. M. Thomas.
Rhode Island University Marine Technical Report Series No. 24, p 213-232, 1974. 18 fig. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Harbors, *Marinas, *Engineering structures, *Coastal structures.
Identifiers: *Floating breakwaters, Wave energy, Moorings, Deep-sea freighters.

A basic feature of the Harris Breakwater (and the difference between it and the Bombardon) is that it presents a thin horizontal barrier to wave motion and causes dissipation of wave energy without creating major stresses in the structure and moorings. Extensive tests were carried out in the Solent on a one-tenth scale model. The test confirmed earlier opinion, and because test readings co-related the structural characteristics and natural sea-state conditions, basic design formulas were established and the calculations checked against actual results. The application of the Harris Breakwater has been extended from marinas to the protection of moorings for deep sea freighters and, combined with the S.B.M., for super-tankers. Other uses are related to flexibility, mobility and lack of effect on existing currents and on the seabed. (See also W75-00404) (NOAA)
W75-00416

SCRAP TIRE FLOATING BREAKWATERS,
Rhode Island Univ., Kingston. Dept. of Ocean Engineering.
T. Kowalski.
Rhode Island University Marine Technical Report Series No. 24, p 233-246, 1974. 13 fig, 4 ref. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Construction materials, *Engineering structures, *Coastal structures, Ocean waves, Waves(Water).
Identifiers: *Floating breakwaters, Wave attenuation, Scrap tires, Sea Grant Program, Tires.

Tests indicate that even a simple three-tire-deep mat has a wave suppression efficiency of approximately 70 percent in waves of significant height of 2.5 ft. Problems were encountered with the strapping materials used which proved inadequate when subjected to continuous twisting action. Better protection is also needed for the foam used for buoyancy. Recommendations are given for the improved methods of construction, foaming of tires for buoyancy and the materials used for tying the tires together. Suggestions are presented for the improvement of the efficiency of wave attenuation by considering the details of the configuration of the leading edge, main body and the trailing edge of the breakwater. (See also W75-00404) (NOAA)
W75-00417

MATERIALS AND CONSTRUCTION TECHNIQUES FOR FLOATING BREAKWATERS,
Alaska Div. of Water and Harbors, Juneau.
D. S. Miller.
Rhode Island University Marine Technical Report Series No. 24, p 247-261, 1974. 2 ref. Presented at Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Construction materials, *Engineering structures, *Coastal structures, Concretes, Prestressed concrete, Steel, Elastomers, Flotation.
Identifiers: *Floating breakwaters, Timber.

The type of materials used for floating breakwaters, their fabrication and final assembly in the chosen location can be more important than the theoretical configuration. Materials used must be durable and corrosion resistant, withstand impact and fatigue stresses, be unsusceptible to damage from freezing and temperature flucuations. Various material choices such as steel, timber, reinforced and prestressed concrete with emphasis on the type of concrete which has been proven durable as well as reinforcing and prestress steel properties, are commented on. All consideration is from the practical standpoint of marine construction and its special problems. Types of moorage and materials which can be utilized are discussed as is the very real problem of location and installation in what must be assumed as adverse weather and poor foundations. (See also W75-00404) (NOAA)
W75-00418

PRACTICAL APPLICATIONS OF FLOATING BREAKWATERS FOR SMALL CRAFT HARBORS,
Alaska Div. of Water and Harbors, Juneau.
D. S. Miller.
Rhode Island University Marine Technical Report Series No. 24, p 263-277, 1974. 15 fig. Presented at Floating Breakwaters Conference, held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Harbors, *Coastal structures, *Engineering structures, Design criteria, Economics, *Alaska.
Identifiers: *Floating breakwaters.

The application and limitations of floating breakwaters for small craft harbors are analyzed. Recommendations are proffered for the use of this type of harbor protection. The development of a structure to suit the economics and needs of the State of Alaska is described. Three projects utilizing the same basic configuration were completed. Various types of anchoring, connections, and design details were utilized. User acceptance and future users are explained. (See also W75-00404) (NOAA)
W75-00419

WORKSHOP I: FUTURE USES OF FLOATING BREAKWATERS,
E. P. Richey.
Rhode Island University Marine Technical Report Series No. 24, p 279-280, 1974. From the Floating Breakwaters Conference held at Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Harbors, Beach erosion, Swimming, Ports, Nuclear powerplants, Power plants.
Identifiers: *Floating breakwaters, Seaplane airports, Offshore nuclear powerplants, Oil refineries.

Future uses of floating breakwaters were discussed at a workshop. Participants said that floating structures, which would dissipate wave energy, might someday be used to protect many harbor facilities, control coastal erosion and protect swimming areas. Among the other ideas were futuristic floating breakwaters which could protect areas for seaplane airports, and breakwaters which could protect offshore nuclear power plants, oil refineries and deep water ports. (See also W75-00404) (NOAA)
W75-00420

WORKSHOP II: FLOATING BREAKWATERS FOR SMALL BOAT MARINAS,
Rhode Island University Marine Technical Report Series No. 24, p 281-282, 1974. From the Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Marinas, *Breakwaters, *Construction materials, *Engineering structures, *Coastal structures.
Identifiers: *Floating breakwaters, Scrap tires, Tires.

An evening workshop brought together several marina owners and managers, local town officials and many of the regular conference participants for a discussion concerning the use of floating breakwaters for small boat marinas. Much of the workshop interest was focused on the potential use of scrap truck and auto tires as material for fabricating relatively inexpensive, effective floating breakwaters for small boat marinas. (See also W75-00404) (NOAA)
W75-00421

A CHRONOLOGICAL SURVEY OF THE LITERATURE ON TRANSPORTABLE AND FLOATING BREAKWATERS,
Naval Research Lab., Washington, D.C; and Naval Civil Engineering Lab., Port Hueneme, Calif.
O. M. Griffin, and D. B. Jones.
Rhode Island University Marine Technical Report Series No 24, p 283-296, 1974. 169 ref. From the Floating Breakwaters Conference held Newport, Rhode Island, April 23-25, 1974.

Descriptors: *Breakwaters, *Coastal structures, *Engineering structures. *Shore protection, *Harbors, *Marines, Models, Bibliographies, Erosion, Ocean waves, Waves(Water), Storms.
Identifiers: *Floating breakwaters, Wave attenuation, Wave energy.

This list of references on floating breakwaters consists mainly of feasibility and model studies published before and since 1972. (See also W75-00404) (NOAA)
W75-00422

TSUNAMI PROPAGATION AND RESPONSE TO COASTAL AREAS,
Hawaii Inst. of Geophysics, Honolulu.
For primary bibliographic entry see Field 2J.
W75-00480

8C. Hydraulic Machinery

LAND DRAINAGE PIPE COUPLING,
G. S. Khomylov, E. F. Kozlovchunas, and A. V. Mysin.
USSR Patent 393398. Applied December 21, 1970. Issued December 12, 1973. Soviet Inventions Illustrated, Vol 5, No 19, 1974.

Descriptors: *Patents, *Design criteria, *Pipes, *Land reclamation, *Land drainage, Drainage, Equipment.
Identifiers: PVC, Pipe coupling.

A land drainage pipe coupling was patented with segmented seals which lower resistance to infiltration or water. This pipe coupling is used for land reclamation systems and is built up from L.D. or H.D. polyethylene or P.V.C. segments. These form domed covers of glass fiber alternating with beaded gaskets. The segments are located in holes drilled around projections of the pipe. Moisture penetrates the domed covers and passes through the slight gaps present between the projections. Improved access to water means that a reduced number of collection pipes is required as compared with the more conventional designs. (Prague-FIRL)
W75-00146

SEWER RELIEF VALVE,
J. V. Oberholtzer.
United States Patent 3,815,629. Issued June 11, 1974. Official Gazette of the United States Patent Office, Vol 923, No 2, p 518, June 11, 1974. 1 fig.

Descriptors: *Patent, *Sewers, *Water pressure, Installation, Plastics, Waste water treatment.
Identifiers: *Sewer relief valves, Sewer lines.

A patent was granted for a sewer relief valve for installation in the cleanout connection to a sewer line. A flapper opens to release sewage water when the water rises in the sewer line. This flapper is self-closing when the water pressure has been relieved on the line so as to seal the gases in the sewer line. The valve unit is molded of a relatively rigid plastic material. The sealing face of the flapper is formed of a softer inserted piece of nylon plastic and forms a gas type seal to the sewer line when the valve is in the normally closed position. (Prague-FIRL)
W75-00172

TUNNELLING WITHOUT BLASTING.
For primary bibliographic entry see Field 8H.
W75-00209

MECHANICAL DRILL FOR DEEP CORING IN TEMPERATE ICE,
Iceland Univ., Reykjavik. Science Inst.
B. Arnason, H. Bjornsson, and P. Theodorsson.
Journal of Glaciology, Vol 13, No 67, p 133-139, 1974. 3 fig, 6 ref.

Descriptors: *Glaciology, *Ice, *Glaciers, *Core drilling, *Drilling equipment, Cores, Drilling, Subsurface investigations, Rotary drilling, Boreholes, Exploration, Drill holes, Drilling fluids.
Identifiers: *Iceland(Vatnajokull), *Temperate ice, Mechanical drill.

A rotary drill for deep coring in temperate ice was constructed and tested. The total length of the drill was 6 m and its weight was 100 kg. A steel armoured cable carried power to the 2 hp electric motor of the drill. The diameter of the hole was 120 mm, the diameter of the core was 90 mm, and the maximum length of the core was 2 m. When an antifreeze mixture at the bottom of the hole was used, it was possible to drill 100-140 cm in about 6 min. Beyond this point, drilling speed was very slow because of ice chips freezing on the cutting bits. A 415 m deep hole was drilled during the summer of 1972 into the temperate accumulation area of Vatnajokull. Core recovery was 99%. The bottom of the glacier at an estimated depth of 400-500 m was not reached because of a fault in the cable. (Sanderson-ISWS)
W75-00325

8D. Soil Mechanics

INCREASING THE EFFICIENCY OF THE USE OF GUIDE CORDS IN THE MAINTENANCE OF A GIVEN SLOPE (POVYSHENIYE EFFEKTIVNOSTI ISPOL'ZOVANIYA KOPIRA-NITI PRI PODDERZHIVANII ZADANNOGO UKLONA),
For primary bibliographic entry see Field 2A.
W75-00142

MEASUREMENT OF VISCOELASTIC PROPERTIES OF SOME RECENT MARINE SEDIMENTS BY A TORSIONALLY OSCILLATING CYLINDER METHOD,
Naval Postgraduate School, Monterey, Calif.
For primary bibliographic entry see Field 2J.
W75-00223

MORGAN CITY, LOUISIANA, AND VICINITY (FINAL ENVIRONMENTAL STATEMENT).
Army Engineer District, New Orleans, La.
For primary bibliographic entry see Field 8A.
W75-00474

MERAMEC PARK LAKE, UPPER MISSISSIPPI RIVER BASIN, MERAMEC RIVER, MISSOURI, VOL I-II (FINAL ENVIRONMENTAL IMPACT STATEMENT).
Army Engineer District, St. Louis, Mo.
For primary bibliographic entry see Field 8A.
W75-00478

FIELD STUDY OF AN UNCONFINED SPOIL DISPOSAL AREA OF THE GULF INTRACOASTAL WATERWAY IN GALVESTON BAY, TEXAS,
Texas A and M Univ., College Station. Coastal and Ocean Engineering Div.
For primary bibliographic entry see Field 5E.
W75-00506

8F. Concrete

LABORATORY STUDY OF EFFECTS OF ENVIRONMENT AND CONSTRUCTION PROCEDURES ON CONCRETE PAVEMENT SURFACES,
Texas Transportation Inst., College Station.
R. O. Wrbas, W. B. Ledbetter, and A. H. Meyer.
Available from the National Technical Information Service, Springfield, Va 22161 as PB-220 078, $3.75 in paper copy, $2.25 in microfiche. Rept No 141-1, Nov 1972. 24 p, 34 fig, 18 tab, 45 ref.

Descriptors: *Construction, *Concrete technology, *Slabs, *Evaporation, *Water loss curing, Reinforced concrete, Environmental effects, Measurement.

A study was conducted to develop improved construction practices related to the consolidation, finishing, and curing of continuously reinforced concrete pavements (CRCP). A total of 56 sidewalk size slabs were cast in controlled environmental rooms. Parameters investigated included type of subbase, method of consolidation (vibration), type of finish, type of curing method, and curing environment. Also, the slabs were utilized to determine the effects of wind on the evaporation rate of water from the surface of the slabs. This was accomplished by generating wind over the surface of the slabs. After a 28 day curing period the slabs were removed from their curing environment and a minimum of three cores were taken from each. These cores were then subjected to diagnostic analyses. At the conclusion of the tests, the data taken from the cores along with the water loss measurements were reduced, tabulated, analyzed, and curves plotted to illustrate the results obtained. (FHA)
W75-00102

THE MINI-SIZE TREATMENT PLANT.
For primary bibliographic entry see Field 5D.
W75-00190

8H. Rapid Excavation

TUNNELLING WITHOUT BLASTING.
Water and Sewage Works, Vol 121, No 6, p 64, June, 1974.

Descriptors: *Construction equipment, *Tunnelling machines, *Tunnel construction, *Sewers, Tunnelling, New York.
Identifiers: Rochester(New York).

A sewer outfall tunnel is being bored through solid bedrock underneath Rochester, New York by the Insana Construction Company. The new boring machine, the Mini-Fullfacer, bores a straight-walled 5- x 8-foot tunnel through solid rock at rates comparable to conventional methods without the inconvenience of overbreak due to blasting. A single cutter disc with cemented Sandvik Coromant carbide bits swings up on a hydraulic cylinder while at the same time rotating and undercutting the rock. Cut and broken rock falls to the tunnel floor and is removed to the rear by means of a continuous chain conveyor built into the base of the machine. Mucking machines behind the Mini-Fullfacer tailer remove the rock cuttings from the tunnel. (Sandoski-FIRL)
W75-00209

AN ANALYSIS OF STRIP MINING METHODS AND EQUIPMENT SELECTION,
Pennsylvania State Univ., University Park. Dept. of Mineral Engineering.
For primary bibliographic entry see Field 5G.
W75-00233

8I. Fisheries Engineering

ALTERATION TESTS OF THE ABERNATHY SALMON DIET, 1971,
Bureau of Sport Fisheries and Wildlife, Longview, Wash. Abernathy Salmon Cultural Development Center.
L. G. Fowler, and J. L. Banks.
U S Bur Sport Fish Wildl Tech Pap. 64, p 1-12. 1972.

Descriptors: *Fish diets, *Salmon, Fry, *Washington, *Chinook salmon.
Identifiers: Abernathy salmon, Anchovy, Cottonseed, Gluten, Lecithin, Meal, Oncorhynchus tshawytscha, Soybean, Whey.

Feeding trials using fall chinook salmon fingerlings (Oncorhynchus tshawytscha) were conducted at the Salmon-Cultural Laboratory, Longview, Washington, during 1971 for the purpose of improving the Abernathy diet formula. The results indicated that cottonseed meal could replace a portion of the fish meal in the diet without reducing fish growth, but similar substitutions of wheat and corn gluten meal reduced growth. Fish growth was significantly increased when a diet containing 50% protein and 3350 kcal/kg was fed as compared with a diet containing 45% protein and 3350 kcal/kg. Soybean lecithin proved to be equal to soybean oil as a caloric source when fed at 2% of the diet. Two types of dried whey product with different levels of lactose content produced similar growth

response. Reducing the dried whey portion of the diet to 5% did not affect growth, nor did methionine supplementation produce any effects. Anchovy meal was unsuitable as a replacement for herring meal.--Copyright 1974, Biological Abstracts, Inc.
W75-00357

BRACKISH WATER CAGE CULTURE OF RAINBOW TROUT (SALMO GAIRDNERI), IN SOUTH ALABAMA,
Alabama Marine Resources Lab., Dauphin Island.
W. M. Tatum.
Trans Am Fish Soc, Vol 102, No 4, p 826-828, 1973, Illus.

Descriptors: *Brackish water, Fish farming, *Rainbow trout, *Alabama.
Identifiers: Cage culture, Mariculture.

Experiments in the brackish water culture of rainbow trout (Salmo gairdneri) were conducted from 25 November 1971-24 March 1972 to determine the feasibility of providing a supplemental cash crop in the coastal water of Alabama during the winter. During this period trout were raised from an initial weight of 93.8 g-354.8 g when stocked at 196 fish/m3 and 322.3 g when stocked at 392 fish/m3. Rainbow trout acclimated easily to brackish water and their potential to southern mariculture appears promising.--Copyright 1974, Biological Abstracts, Inc.
W75-00473

THE FOOD CHAIN DYNAMICS OF THE OYSTER, CLAM, AND MUSSEL IN AN AQUACULTURE FOOD CHAIN,
Woods Hole Oceanographic Institution, Mass.
K. R. Tenore, J. C. Goldman, and J. P. Clarner.
J Exp Mar Biol Ecol. Vol 12, No 2, p 157-165. 1973, Illus.

Descriptors: *Mussels, *Oysters, *Clams, Fish diets, *Food chains, Aquiculture.
Identifiers: Crassostrea virginica, Mercenaria mercenaria, Mytilus edulis.

The food chain dynamics of the edible mussel Mytilus edulis, the American oyster Crassostrea virginica and the hard clam Mercenaria mercenaria were investigated in large experimental tanks with flowing, filtered sea water and controlled addition of phytoplankton. The feeding rate of the mussel (5.36 microgram carbon removed/1/g C animal was higher than that of the oyster (3.92) and clam (3.03) but the ecological efficiencies (net production/ingested food) x 100 of the clam (23.69%) and the oyster (18.38%) were higher than that of the mussel (10.01%). The food chain efficiencies (net production/available food) were lower than the ecological efficiencies, suggesting underexploitation of the available food. The clam, although having a lower feeding rate, was more efficient in utilizing the food it filtered and so showed the highest net production. The rates (microgram-at/1/g C animal) of regeneration of nutrients, especially total inorganic N (mussel, 2.1723 x 10 to the 3rd power; oyster, 7.4270 x 10 to the minus 3rd power and clam, 8.1750 x 10 to the minus 3rd power) along with reported high biodeposition rates of bivalves suggest that multi-species aquaculture systems would be more efficient and productive than 1 sp. systems.--Copyright 1974, Biological Abstracts, Inc.
W75-00500

10. SCIENTIFIC AND TECHNICAL INFORMATION

10A. Acquisition And Processing

EVALUATION OF WATER QUALITY BY MEANS OF ENZYMES AND OF 'THRUFLO' ANALYZERS,
Oklahoma State Univ., Stillwater. Dept. of Chemistry.
For primary bibliographic entry see Field 5A.
W75-00427

10B. Reference and Retrieval

INVENTORY OF RESEARCH ACTIVITIES IN THE LAKE TAHOE AREA, 1878-1974,
Lake Tahoe Area Research Coordination Board, South Lake Tahoe, Calif.
For primary bibliographic entry see Field 2H.
W75-00280

10C. Secondary Publication And Distribution

BIBLIOGRAPHY OF INTERACTIVE PATTERN RECOGNITION AND RELATED TOPICS,
Connecticut Univ., Storrs. Dept. of Electrical Engineering and Computer Science.
For primary bibliographic entry see Field 6A.
W75-00267

10D. Specialized Information Center Services

DICTIONARY OF THE NATIONAL WATER QUALITY DATA BANK (NAQUADAT).
Department of the Environment, Ottawa (Ontario).
For primary bibliographic entry see Field 7C.
W75-00224

OCEAN ENGINEERING AND OCEANOGRAPHY TECHNICAL LITERATURE COLLECTION, WATER RESOURCES CENTER ARCHIVES,
California Univ., Berkeley. Hydraulic Engineering Lab.
M. Poniatowski.
Report No HEL 26-1, April 1974. 197 p, 1496 ref.

Descriptors: *Oceanography, *Bibliographies, *Water resources, Coasts, Beaches, Estuaries, Measuring instruments, Documentation.
Identifiers: *Ocean engineering, *Coastal zone, *Coastal water, Marine meteorology.

The bibliographical listing catalogs a portion of a collection of materials on ocean engineering and oceanography housed at the Water Resources Center Archives, University of California, Berkeley. The entire collection consists of approximately 20,000 titles; 1496 selected titles are presented here. These reports and reprints were collected over the last twenty-five years as a by-product of research activities in this field, largely under Professors Robert L. Wiegel, Joe W. Johnson, and Morrough P. O'Brien. Author and subject indexes are provided. (NOAA)
W75-00483

10F. Preparation Of Reviews

ORGANICS,
Tennessee Univ., Knoxville. Dept. of Civil Engineering.
For primary bibliographic entry see Field 05B.
W75-00194

DETERGENTS,
MCA Engineering Corp., Baltimore, Md.
For primary bibliographic entry see Field 05B.
W75-00196

WATER CHARACTERISTICS,
Maine Univ., Orono.
For primary bibliographic entry see Field 05A.
W75-00197

HEAVY METALS AND OTHER TRACE ELEMENTS,
Illinois Univ., Urbana.
For primary bibliographic entry see Field 04C.
W75-00198

MICROBIOLOGY: DETECTION, OCCURRENCE, AND REMOVAL OF VIRUSES,
National Environmental Research Center, Cincinnati, Ohio.
For primary bibliographic entry see Field 05A.
W75-00199

MARINE AND ESTUARINE POLLUTION,
California State Univ., Long Beach. Dept. of Biology.
For primary bibliographic entry see Field 05B.
W75-00200

AQUATIC SEDIMENTS,
Massachusetts Univ., Amherst.
For primary bibliographic entry see Field 05B.
W75-00201

RADIOACTIVE WASTES,
Minnesota Univ., Minneapolis.
For primary bibliographic entry see Field 05B.
W75-00202

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Toxicity of Various Formulations of 2,4-D to Salmonids in Southeast Alaska,
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W75-00103 8B

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W75-00307 5G

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W75-00539 4A

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ENVIRONMENTAL PROTECTION AGENCY, ANNAPOLIS, MD. ANNAPOLIS FIELD OFFICE.
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Variables to be Measured in Wastewater Treatment Plant Monitoring Control,
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ENVIRONMENTAL PROTECTION AGENCY, GULF BREEZE, FLA. GULF BREEZE ENVIRONMENTAL RESEARCH LAB.
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ENVIRONMENTAL PROTECTION AGENCY, SEATTLE, WASH. REGION X.
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ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C.
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ENVIRONMENTAL PROTECTION AGENCY, WASHINGTON, D.C. HAZARDOUS MATERIAL SPILL CONTROL PROGRAM.
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FINNISH PULP AND PAPER RESEARCH INST., HELSINKI.
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Water Pollution: Governmental Activities in Broward County,
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Upper Suwannee River, Evaluation of a Proposed DRI as an Area of Critical State Concern, Columbia and Hamilton Counties, Florida.
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Seasonal Variations and Distribution of Dissolved Iron in an Aquifer,
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Soil-Water-Plant Relations Utilizing Divided Root Systems of Soybean,
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Effect of a Hypolimnion Discharge on Growth of Bluegill (Lepomis Macrochirus) in the Savannah River, Georgia,
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The Effect of Long Waves on Flow Currents in Channel-Type Reservoirs,
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Evaluation of the Penman Method for the Computation of Evaporation from Water Bodies Using Observed Data,
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Salinity Problems of Organisms in Coastal Areas Subject to the Effect of Engineering Works,
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GULF OIL CANADA LTD., TORONTO (ONTARIO), AND ATLANTIC RICHFIELD CANADA LTD., CALGANY (ALBERTA). (ASSIGNEE)
Clarification of Tar Sands Middlings Water,
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Oxygen in the Marine Hygropsammal and the Vertical Microdistribution of Oligochaetes,
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Some Observations About the Federal Water Pollution Control Act Amendments of 1972,
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Inhibition of Inter-Microbial Predation by Chlorinated Hydrocarbons,
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Tsunami Propagation and Response to Coastal Areas,
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Macroinvertebrate Community Structure as an Indicator of Acid Mine Pollution,
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HELSINKI CITY ENGINEER'S OFFICE (FINLAND). WATER CONSERVATION LAB.
A Telemetering System Including Current Meters of the Buoyant Kite Type,
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HIROSHIMA UNIV. (JAPAN). FACULTY OF EDUCATION.
Food Habit of Crucian Carp, Carassius Carassius Langsdorfii Temminck Et Schlegel in Lake Korjima, (In Japanese),
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HOKKAIDO ABASHIRI FISHERIES EXPERIMENT STATION (JAPAN).
Studies on the Ecology of the Scallop, Patinopecten Yessoensis (Jay): 3. On the Diurnal Vertical Distribution of Scallop Larvae, (In Japanese),
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HOWARD, PRIM, RICE, NEMEROVSKI, CANADY, AND POLLAK, SAN FRANCISCO, CALIF.
The Antiparalleling Statute: A New Dimension in Public Utility Condemnation,
W75-00477 6E

HYDROBIOLOGICAL RESEARCH INST., JYVASKYLA (FINLAND).
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Critical Oxygen Deficit for Bank Outfall,
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Gel- and Ultramembrane Filtration of Aquatic Humus: A Comparison of the Two Methods,
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INSTITUT PASTEUR, PARIS (FRANCE). LABORATOIRE D'EPIDEMIOLOGIE.
Influence of the Creation of Artificial Lakes of the Great African Barrages on Parasitic Endemics: A Comparative Study of Akosoma Lake on Black Volta and Nasser Lake on the Nile (Egypt, Sudan),
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INSTITUT ZA VODOPRIVREDU JAROSLAV CERNI, BELGRADE (YUGOSLAVIA).

INSTITUT ZA VODOPRIVREDU JAROSLAV CERNI, BELGRADE (YUGOSLAVIA).
Problems of Water Balance and Trend in the Water Level of Lake Skadar,
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INSTITUTE FOR AGRICULTURAL RESEARCH, ZARIA (NIGERIA).
The Influence of Light and Water Deficit Upon Diffusive Resistance of Leaves of Vicia Faba L,
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INSTITUTO NACIONAL DE PESQUISAS DA AMAZONIA, MANAUS (BRAZIL).
Observations on Water Movement, Chemical Layering and Fish Migrations in Varzea-Lakes at the Middle Solimoes (River Amazon), (In German),
W75-00136 5C

INTERNATIONAL FIELD YEAR FOR THE GREAT LAKES PROJECT OFFICE, ROCKVILLE, MD.
IFYGL: Scientific Overview,
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INTERNATIONAL HYDROLOGICAL DECADE, STOCKHOLM (SWEDEN). SWEDISH NATIONAL COMMITTEE.
The Lake Velen Project and Some of Its Results,
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INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN, BETHESDA, MD.
The Potomac: Putting the Pieces Together.
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IRKUTSKII GOSUDARSTVENNYI UNIVERSITET (USSR).
The Water Balance and the Level Regime of Lake Khubsugul (Kosogol),
W75-00050 2H

ISTITUTO DI BIOLOGIA DEL MARE, VENICE (ITALY).
Oceanography of Northern Adriatic Sea: 2. Hydrologic Features: Cruises January-February and April-May 1966,
W75-00359 2L

Automatic Determination of Ammonia and Amino-Acid Nitrogen in Marine and Brackish Waters, (In Italian),
W75-00387 2K

JAAKKO POYRY AND CO., HELSINKI (FINLAND).
On the Effects of Methyl Mercaptan and its Oxidation Products on Aquatic Microbes and Fish,
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JAPAN SEA REGIONAL FISHERIES RESEARCH LAB., NIIGATA.
Ecological Studies on the Jack Mackerel, Trachurus Japonicus (Temminck et Schlegel: III. Amount of Food Consumption for Growth of Young Fish), (In Japanese),
W75-00445 2L

JOHNS HOPKINS UNIV., BALTIMORE, MD. CHESAPEAKE BAY INST.
Effects of Exposure to Time-Excess Temperature Histories Typically Experienced at Power Plants on the Hatching Success of Fish Eggs,
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JOHNSON (A.) CONSTRUCTION CO. LTD. (SCOTLAND). INKA DIV.
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Tolerance of Escherichia Coli to Cadmium,
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JYVASKYLA UNIV. (FINLAND). DEPT. OF BIOLOGY.
Zooplankton Species as Indicators of Environment,
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Design and Operational Model for Complete Mixing Activated Sludge System,
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Reservoir Sedimentation: A Computer Simulation,
W75-00004 2J

KARLOVA UNIVERSITA, PRAGUE (CZECHOSLOVAKIA). DEPT. OF PLANT PHYSIOLOGY.
The Density of Stomata in Leaves of Two Ecotypes of Phragmites Communis Trin. in Southern Bohemia,
W75-00541 2I

KAZAN STATE UNIV. (USSR). DEPT. OF VERTEBRATE ZOOLOGY.
Characteristics of the Reproduction and Growth of the Tiulka, A New Component of the Fish Fauna of the Kuibyshev Reservoir, (In Russian),
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KENNEDY ENGINEERS, SAN FRANCISCO, CALIF.
AWWA Management Program Developments,
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KENTUCKY STATE DEPT. OF FISH AND WILDLIFE RESOURCES, FRANKFURT.
Investigations of the Influence of the Effluent from a Concentrated Industrial Complex on a Large River,
W75-00479 5B

KENTUCKY UNIV., LEXINGTON. WATER RESOURCES RESEARCH INST.
Spatially Varied Subcritical and Supercritical Flow in Gullies,
W75-00269 2J

Metabolic Capabilities of Sulfur Oxidizing Bacteria and Their Role in Water Pollution,
W75-00270 5B

KYOTO MUNICIPAL HYGIENIC LAB. (JAPAN).
Study on Subacute Toxicity of Carbon n-Hexane-Acetone Extract Recovered from Drinking Water,
W75-00120 5C

KYOTO UNIV. (JAPAN). FACULTY OF PHARMACEUTICAL SCIENCES.
Metabolites of an Actinomyces Biwaki-B Strain, Isolated from Sediment in Lake Biwa: Identification of the Odorous Compounds, Geosmin and 2-Methylisoporneol, and Analysis of Fatty Acids, (In Japanese),
W75-00349 5A

LAKE TAHOE AREA RESEARCH COORDINATION BOARD, SOUTH LAKE TAHOE, CALIF.
Inventory of Research Activities in the Lake Tahoe Area, 1878-1974,
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LAS CRUCES WASTEWATER TREATMENT PLANT, N. MEX.
BOD: A Re-Evaluation,
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Natural Electric Field in Freshwater Lakes,
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Water Exchange in Lake Baikal,
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LOS ANGELES COUNTY SANITATION DISTRICT, WHITTIER, CALIF. SAN JOSE CREEK WATER QUALITY LAB.
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LOUISIANA STATE UNIV., BATON ROUGE. COASTAL STUDIES INST.
Rhythmic Patterns of Beach Topography,
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LOUISIANA STATE UNIV., BATON ROUGE. DEPT. OF GEOGRAPHY AND ANTHROPOLOGY.
Lateral Erosion and Overbank Deposition on the Mississippi River in Louisiana Caused by 1973 Flooding,
W75-00331 2J

LOUISIANA WILD LIFE AND FISHERIES COMMISSION, NEW ORLEANS. DIV. OF OYSTERS, WATER BOTTOMS AND SEAFOODS.
The Mollusk Communities of Lakes Ponchartrain and Maupepas, Louisiana,
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LUND INST. OF TECH. (SWEDEN).
Conclusions About Turbulent Exchange Coefficients from Model Studies,
W75-00070 2H

Mathematical Models of Wind Induced Circulation in a Lake,
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MAIN GEOPHYSICAL OBSERVATORY, LENINGRAD (USSR).
Determination of Evaporation from Lake and Reservoir Surfaces Using the Heat Balance Method,
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The Turbulent Regime of a Shallow Reservoir,
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MAINE UNIV., ARONO. SCHOOL OF LAW.
Public Rights in Maine Waters,
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MAINE UNIV., ORONO.
Water Characteristics,
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Expansion Sparks New Design,
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MARINE RESOURCES LAB., DAUPHIN ISLAND.
Effects on Water Quality When Dredging a Polluted Harbor Using Confined Spoil Disposal,
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MASSACHUSETTS INST. OF TECH., CAMBRIDGE. DEPT. OF CIVIL ENGINEERING.
Potential Biological Effects of Hypothetical Oil Discharges in the Atlantic Coast and Gulf of Alaska,
W75-00485 5C

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. DEPT. OF OCEAN ENGINEERING.
Primary, Physical Impacts of Offshore Petroleum Developments.
W75-00486 5B

MASSACHUSETTS INST. OF TECH., CAMBRIDGE. RALPH M. PARSONS LAB. FOR WATER RESOURCES AND HYDRODYNAMICS.
Mathematical Models of the Massachusetts Bay. Part III. A Mathematical Model for the Dispersion of Suspended Sediments in Coastal Waters,
W75-00513 2J

MASSACHUSETTS UNIV., AMHERST.
Aquatic Sediments,
W75-00201 5B

MASSACHUSETTS UNIV., AMHERST. DEPT. OF CIVIL ENGINEERING.; AND STONE AND WEBSTER ENGINEERING CORP., BOSTON, MASS. HYDROELECTRIC DIV.
Attenuation of Wind-generated Deep Water Waves by Pneumatic and Hydraulic Breakwaters,
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MCA ENGINEERING CORP., BALTIMORE, MD.
Detergents,
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MEKOROT WATER CO. (ISRAEL). B. C. NESIN WATER QUALITY LAB.
The Effect of Chlorination on Tilapia Fish,
W75-00431 5C

MELBOURNE AND METROPOLITAN BOARD OF WORKS FARM (AUSTRALIA).
Waste Into Wealth,
W75-00106 5D

METCALF AND EDDY, INC., BOSTON, MASS.
The New England Water-Utility Story,
W75-00538 5G

METEOROLOGISCHER DIENST DER DEUTSCHEN DEMOKRATISCHEN REPUBLIK, BERLIN. FORSCHUNGSINSTITUT FUER HYDROMETEOROLOGIE.
Annual Variation of Seepage of Lakes in the Moraine Area of the German Democratic Republic,
W75-00041 2H

A Comparison of Various Methods Used for the Determination of Evaporation from Free Water Surfaces,
W75-00061 2D

Stability of Thermal Stratification in a Lake,
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MICHIGAN ATTORNEY GENERAL'S OFFICE, EAST LANSING.
Diversion of Lake Michigan Waters,
W75-00303 6E

MICHIGAN STATE UNIV., EAST LANSING. DEPT. OF CIVIL ENGINEERING.
Two-Dimensional Finite Element Modeling of Transient Flow in Regional Aquifer Systems - Analysis of Groundwater Flow in Relation to Water Quality Improvement,
W75-00426 5B

MINNESOTA DEPT. OF CONSERVATION, ST. PAUL. WATER SECTION.
The Web of Water Management,
W75-00476 6B

MINNESOTA UNIV., MINNEAPOLIS.
Radioactive Wastes,
W75-00202 5B

MISSISSIPPI STATE UNIV., STATE COLLEGE. DEPT. OF CIVIL ENGINEERING.
Multivariate Techniques for Water Quality Analysis,
W75-00022 7C

MISSISSIPPI UNIV., UNIVERSITY. SCHOOL OF BUSINESS ADMINISTRATION.
Factors Affecting Residential Water Consumption: The Managerial Viewpoint,
W75-00139 6D

MITSUI MINING AND SMELTING CO. LTD., TOKYO (JAPAN). (ASSIGNEE).
Process for Treatment of Waste Liquids Containing Difficultly Decomposable Cyano-Complex,
W75-00174 5D

MOBIL RESEARCH AND DEVELOPMENT CORP., NEW YORK CITY. (ASSIGNEE).
Method and Apparatus for Detecting Particulate Material in Flow Stream,
W75-00178 2J

MONTANA STATE UNIV., BOZEMAN. FISHERIES BIOASSAY LAB.
Effect of Complexation on Toxicity of Copper to Fishes,
W75-00452 5C

MOSS LANDING MARINE LAB., CALIF.
The Hydrography of Elkhorn Slough, A Shallow California Coastal Embayment,
W75-00497 2L

NATAL UNIV., DURBAN (SOUTH AFRICA). OCEANOGRAPHIC RESEARCH INST.
A Satellite-Tracked Buoy in the Agulhas Current,
W75-00330 7B

NATIONAL ENVIRONMENTAL RESEARCH CENTER, ATHENS, GA. SOUTHEAST ENVIRONMENTAL RESEARCH LAB.
Gas-Liquid Chromatography-Mass Spectrometry of Organomercury Compounds,
W75-00364 5A

NATIONAL ENVIRONMENTAL RESEARCH CENTER, CINCINNATI, OHIO.
Microbiology: Detection, Occurrence, and Removal of Viruses,
W75-00199 5A

NATIONAL ENVIRONMENTAL RESEARCH CENTER, CORVALLIS, OREG.
Role of Phosphorus in Eutrophication,
W75-00276 5C

NATIONAL ENVIRONMENTAL RESEARCH CENTER, CORVALLIS, OREG. CANADA CENTRE FOR INLAND WATERS, BURLINGTON (ONTARIO).; AND NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, ANN ARBOR, MICH. GREAT LAKES ENVIRONMENTAL LAB.
Biology-Chemistry Program for the International Field Year for the Great Lakes,
W75-00402 2H

NATIONAL INST. OF HYGIENE, WARSAW (POLAND). DEPT. OF COMMUNAL HYGIENE.
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A. Centers of Competence		
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Franklin Institute (FIRL), Municipal Wastewater Treatment Technology	W75-00107 -- 00120 00122 -- 00134 00137 -- 00170 00172 -- 00174 00177 -- 00183 00185 -- 00194 00196 -- 00209 00211 -- 00216	101
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University of North Carolina, Metropolitan Water Resources Planning and Management	W75-00538 -- 00540 00542 -- 00550	12
U. S. Geological Survey, Hydrology	W75-00217 -- 00259 00277	44
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CENTERS OF COMPETENCE AND THEIR SUBJECT COVERAGE

- Ground and surface water hydrology at the Water Resources Division of the U. S. Geological Survey, U. S. Department of the Interior.
- Metropolitan water resources planning and management at the Center for Urban and Regional Studies of University of North Carolina.
- Eastern United States water law at the College of Law of the University of Florida.
- Policy models of water resources systems at the Department of Water Resources Engineering of Cornell University.
- Water resources economics at the Water Resources Center of the University of Wisconsin.
- Eutrophication at the Water Resources Center of the University of Wisconsin.
- Water resources of arid lands at the Office of Arid Lands Studies of the University of Arizona.
- Water well construction technology at the National Water Well Association.
- Water-related aspects of nuclear radiation and safety at the Oak Ridge National Laboratory.
- Water resource aspects of the pulp and paper industry at the Institute of Paper Chemistry.

Supported by the Environmental Protection Agency in cooperation with WRSIC

- Effect on water quality of irrigation return flows at the Department of Agricultural Engineering of Colorado State University.
- Agricultural livestock waste at East Central State College, Oklahoma.
- Municipal wastewater treatment technology at the Franklin Institute Research Laboratories.

Subject Fields

1 NATURE OF WATER

2 WATER CYCLE

3 WATER SUPPLY AUGMENTATION AND CONSERVATION

4 WATER QUANTITY MANAGEMENT AND CONTROL

5 WATER QUALITY MANAGEMENT AND PROTECTION

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